

3D WORLD

THE ONLY MAGAZINE FOR 3D ARTISTS



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GAME PLAN

All you need to know to survive as a next-gen 3D games artist

skin deep

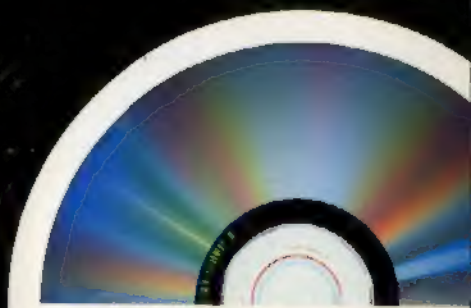
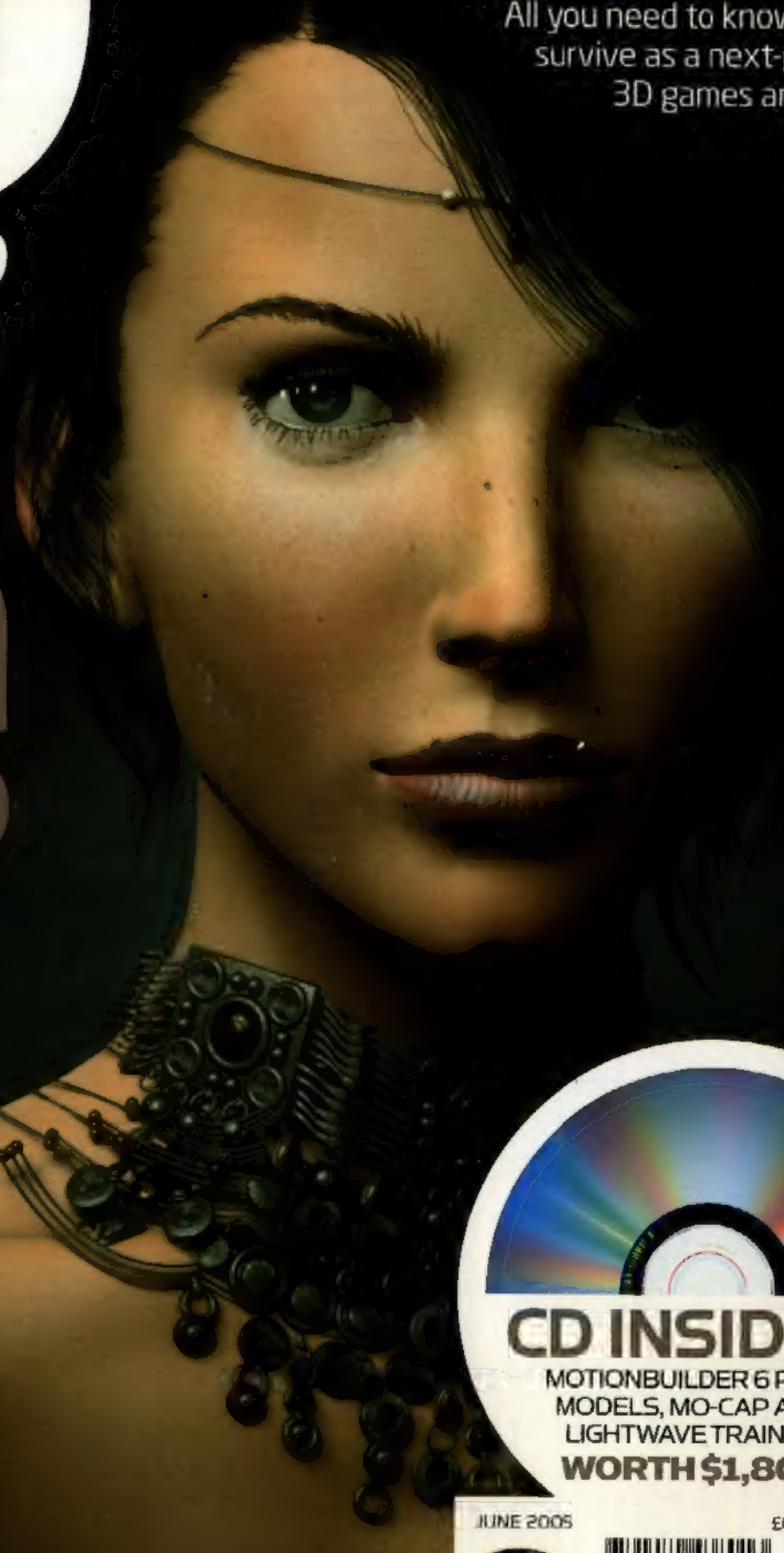
Masterclass: how to texture truly convincing photorealistic human skin

DON'T PANIC!

A sideways look at Cinesite's VFX for The Hitchhiker's Guide to the Galaxy



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COVER ARTIST

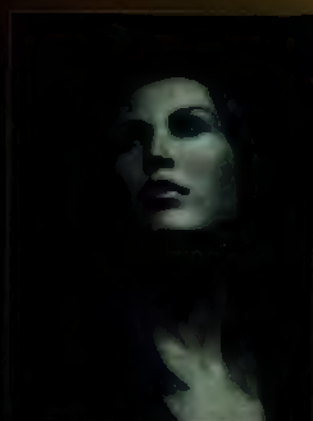
Olivier Ponsonnet

THIS ISSUE'S COVER ARTIST is Olivier Ponsonnet. A French student living in Bordeaux, Olivier is currently working on a programming course while indulging in his passion for 3D, where his unstructured techniques often lead to surprising results. As he says: "It's not uncommon that I obtain something good but completely different from the idea I had at the beginning."

Olivier's main inspirations come from a variety of European comics, including *Xico*, *Ropaces* and *Sho*, as well as manga titles, such as *Appleseed*, *Gunnm* and *Blame!* However, he freely admits that anything can be a source of inspiration, from TV shows and movies to someone he passes in the street.

Olivier uses *3ds max* for modelling, shading, lighting and rendering, and *Photoshop* for post-production and maps. He's recently bought a Wacom Intuos3 tablet for creating maps, but acknowledges that it isn't the hardware or software that produces an effective model: "I search for aestheticism and beauty through all the female portraits I do," he says. "In fact, the two things are interdependent: to make a beautiful character, you need to give them soul. That's what I try to do."

You can discover more of Olivier's techniques and tips in this issue's Trade Secrets feature, starting on page 50.
(w) <http://re.tv.free.fr>





skin deep

042 We delve beneath the surface of digital dermatology, with proven methods for truly photorealistic skin



3D apps: the next generation

016 Will you be using 3ds max, Maya or XSI to create digital assets for next-generation console games? The big three apps face off in our main story

"DON'T PANIC!"

064 *The Hitchhiker's Guide to the Galaxy* finally makes it to the movies. Find out all about the film's earth-shattering VFX work, courtesy of Cinesite





Next-gen gaming

032 More powerful consoles will call for a smarter breed of 3D artist. Find out what you need to know to stay ahead of the console curve

Group test

REVIEWS Which graphics tablet should you take in times of stress? **084**



Perfect timing

TUTORIAL Learn animation with part two of our starter tutorial series **052**



Clouds in max

LEAD Q&A Create a volumetric cloudscape in 3ds max **072**

REGULARS

003 COVER ARTIST
This issue: Olivier Ponsonnet

007 EDITOR'S PERSPECTIVE
Our views on the 3D industry

008 MAILBOX
Your views on the 3D industry

010 EXHIBITION
Get your own work into print

040 SUBSCRIBE
Subscribe to the mag and save

062 SUBSCRIBE WORLDWIDE
Discount subs outside the UK

083 NEXT ISSUE
In the magazine next month

105 BACK ISSUES
Missed an issue? Buy it here

106 CLASSIFIEDS
New jobs and 3D services

109 BUSINESS END
Legal and financial advice

111 INSPIRATIONS
This issue: Rod Lord's graphics

113 COMPETITION
Win one of five copies of *modo*

CONTENTS INDEX LISTING

016 PRE-VIZ
Which 3D software app will rule next-gen game development?

018 GDC 2005 REPORT
News from the games show

020 PRODUCT PREVIEW
Autodesk's *toxik* promises to revolutionise your workflow

022 PROJECTS ROUND-UP
The pros show us how it's done

027 CRAIG ZEROUNI
Does CG have 'career structure', asks our US correspondent?

028 CLOSE UP
The Mill's flashy new Dyson ad

032 NEXT-GEN GAMING
We reveal what next-gen games consoles will mean for 3D artists

044 TUTORIAL
Texturing human skin in *LightWave* and *Photoshop*

050 TRADE SECRETS
Add lifelike touches to 3D skin

052 PERFECT TIMING: PART 2
Beginners' guide to mastering animation timing and motion

056 SCRIPTING FOR ARTISTS
Hands-on MEL scripting in *Maya*

058 TUTORIAL
Use motion capture data with *MotionBuilder PLE* on our CD

064 DON'T PANIC!
Cinesite brings Douglas Adams' *Hitchhiker's Guide* to cinemas

072 LEAD Q&A
Volumetric clouds in *3ds max*

076 QUICK QUESTIONS
Your technical problems solved

084 GROUP TEST
3D graphics tablets compared

090 REVIEW
Poser 6

092 REVIEW
combustion 4

094 REVIEW
Vue 5 Pro Studio

096 3D TRAINING
A range of 3D training resources on DVD reviewed and rated

098 ON OUR WEBSITE
The new *3D World* site revealed

100 BUYERS' GUIDE
3D software: prices and verdicts



ON THE CD

● *MotionBuilder PLE*, models, mo-cap and *LightWave* training
SEE PAGE 114

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3D World is brought to you with the help and advice of leading 3D industry figures

SHELLEY PAGE

European Representative, DreamWorks Animation
Shelley Page started her career in feature animation as Backgrounds Supervisor on Disney's *Who Framed Roger Rabbit?* She was one of the first artists hired to form DreamWorks Animation in 1995. She is now DreamWorks' European Representative resourcing new talent for the studio.
www.dreamworks.com

JORDI BARES

Senior 3D Animator, The Mill
Jordi Bares worked for eight years in the games and film industries in his native Spain, before moving to London in 2000, where he has also freelanced at Jim Henson's Creature Shop and Passion Pictures. The winner of many awards, he was nominated for an Emmy for his work on the BBC documentary *Pyramid*.
www.the-mill.com

ANDREW DAFFY

CGI Supervisor, House of Curves
Andrew Daffy has worked in the CGI industry for ten years on projects that have accumulated over 30 awards. He was recently named one of Alias's *Maya Masters* for 2004. His new company, The House of Curves, will act as both a studio and a training school.
www.thehouseofcurves.com

ALEX MORRIS

Director, Hayes Davidson
Alex Morris qualified as an architect in 1990 and joined architectural visualisation agency Hayes Davidson in 1996, having completed over 40 buildings across a number of sectors. He is responsible for many of HD's landmark images, including the UK's Millennium Dome, and the Tate Modern art gallery.
www.hayesdavidson.com

JOLYON WEBB

Principal Artist, Codemasters Software Company
Jolyon Webb moved into developing game art after years as a freelance illustrator. He works at leading videogame studio Codemasters as Principal Artist in the Central Technology Group: the company's internal research and development team.
www.codemasters.co.uk

AARDMAN ANIMATIONS

Scott Pleydell-Pearce, Bobby Proctor and Stefan Marjoram
Respectively CGI Animation Head of Department, CGI Lighting/Technical Head of Department and a Creative Director for the commercials department, Scott, Bobby and Stefan have over 20 years' combined experience at Aardman, working on a range of award-winning ads, idents and short films.
www.aardman.com

Editor's perspective



The late Douglas Adams was once asked if he could put into words what it would mean to him to see *The Hitchhiker's Guide to the Galaxy* at the cinema. "Yes," he said, "it would mean that the last ten years of my life weren't completely wasted." Adams, as the publication of his personal writings makes clear, really, really did want to see his most famous creation made into a film.

To this end, he once sent the studio executive David Vogel a fax listing 32 separate numbers on which he could be contacted – including his cellphone, his home phone, his office, his agent's office, his US agent's office, his wife's office, his mother's house, his neighbours, and the supermarket at which he usually shopped – before concluding, rather brilliantly: "If you manage not to reach me, I shall know you're trying not to, very, very hard indeed."

So it's bitterly ironic that, while the movie version of *The Hitchhiker's Guide to the Galaxy* is finally due to hit the cinemas this month, Adams isn't around to see it. The one consolation is that the years the film spent stranded in development hell did at least give the world a chance to catch up, to the point at which the digital technology he loved could be used to create the special effects.

(Adams, it should be noted, was an unashamed apologist for Cool New Stuff. In addition to being one of the first people to own a laptop – and possibly Apple Computer's greatest unpaid publicity asset – he once confessed to having a cupboard full of so many "little dangly things" that it would be quicker to move house than to work out what they were actually supposed to do.)

We have now reached the point in the column at which the explanation is due. This is the paragraph that takes all of the previous anecdotes and knits them into an argument of, if not actual penetrating brilliance and insight, at least some relevance to the 3D community. Unfortunately, this month, there will be no explanation. There is no higher purpose to these digressions, other than to celebrate a writer whose work I have admired for over 20 years. (I figure that, as editor of the magazine, I'm occasionally permitted these little 500-word indulgences.)

The only other information I have to impart is that *3D World* now has a new website. I could attempt to make some kind of conceptual connection to the preceding paragraphs along the lines that Adams, in addition to being a Mac geek, was also one of the earliest enthusiasts for the World Wide Web... but instead, I'll confine myself to noting that the site can be found at www.3dworldmag.com, and that it also contains all sorts of Cool New Stuff, including the option to download tutorials, animated shorts, and bonus material for the articles published in the magazine.

Incidentally, if you look very hard at the planet factory sequence in the movie, you'll notice that one of the background objects looks oddly familiar. The face on the 'head planet' is that of Adams himself, based on a scan taken before he died. The need to pay tribute to your heroes may be whimsical and gratuitous – but at least, it seems, it's common to a lot of people in the 3D industry.

JIM THACKER Editor
jim.thacker@futurenet.co.uk

LETTER OF THE MONTH

Being a Mac studio, we loved the new look of the magazine. For a while there, you looked like becoming *3ds max World*, and it was really pissing us off. For the same reason, I also loved your article 'Is there a future for 3D on the Mac?'

[Pre-viz, issue 63]. It brought a big smile to my face. In fact, I'm still smiling as I write to you.

To people who consider 3D on the Mac a waste of time: my studio was formed in November 1993. We don't advertise, we don't go looking for clients and we don't even send out business cards or brochures. In that respect, you could regard us as the laziest company in the world, with the worst website in the world. What's more, we're totally Mac-based. So we shouldn't still be around, right?

Wrong. We now have so much work our electricity supply is tripping out. In fact, the reason we don't self-promote is because we're too bloody busy! I've forgotten what a bed looks like and my dog has to gnaw through the power cables just to get a walk.

I can understand why Softimage doesn't port XSI to the Mac, but then, having said that, does a supermarket wait until a queue forms in the street before setting up shop? I can also see why 20 per cent of Maya sales are to the Mac market. I believe it should be a lot more, marketed correctly.

The problem, as I see it, is that the Mac market and Mac users are different. The industry we cater for is different. There's a hell of a lot more to 3D than

games and Hollywood movies, and if the software developers took a closer look at why people are doing

3D on the Mac platform, they might just realise that a couple of tweaks and a small adjustment to how they market their products could change everything.

As for myself, as each day passes, more and more emails come in saying, "Are you busy?" So yes, I can safely say that there is a future for 3D on the Mac. Unless, of course, we get barred from the electricity grid, or my dog gets through all the cables.

Misterboat | Boldbrush Studio

To us, your penultimate point seems to be the crucial one. In our experience, 3D studios divide into two camps: those who also do

other work, such as multimedia or graphic design, and those who think of themselves as 'pure' 3D artists. The former tend to favour Macs, while the latter tend to be stubbornly Windows-based. Software usage also divides along much the same lines.

A copy of our Letter of the Month prize is in the post to you. From the sound of things, you may not have the time to read it, but at least you might be able to use it to distract your dog.



● Pre-viz, issue 63: the answer to the headline question above is a definite 'yes', then...

GOING OUT IN TILE

> Having been a reader of the magazine for years, I thought you might be interested to hear of another way our 3D projects can be realised.

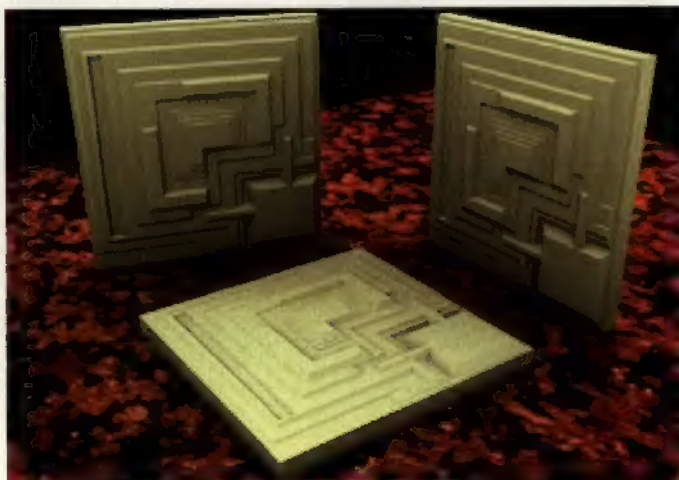
Last year, I helped remodel the kitchen at my parents' house and

wanted to do something special for the back splashes. I created a tile design heavily influenced by Frank Lloyd Wright's Ennis-Brown house, seen in movies such as *Blade Runner*. The tile was modelled using *3ds max 6* and exported as an STL file, which I sent to

www.3darttopart.com [a 3D printing firm]. I then rented space in a local clay studio to make moulds from the printed model and used these to create the actual ceramic tiles in a tile press. Finally, I chose a glaze that complemented the stain we had put on the new cabinets. After the final firing, our contractor installed the tiles in the back splash.

I really liked the opportunity to take something that I'd created on the computer and turn it into something unique. It was also fantastic to move away from the screen and get my hands dirty making something real.

Jeff Harper | Via email



● For most artists, 'tilling' is what textures do. However, thanks to 3D printing techniques, reader Jeff Harper was able to turn these *3ds max* models into something more literal

Since we first covered the subject in issue 52, we've received a number of emails about the joys of 3D printing. This, however, has to be the most unusual use of the technique so far. Can you go one better? If you've printed out a 1:16 scale replica of the Empire State Building - or perhaps a new type of prosthetic limb - we'd love to hear from you...

VALIANT? PAH!

> I couldn't help but notice that the producers of new CGI pigeon flick *Valiant* are promoting their movie as the UK's first CG feature film. Sorry guys, but it isn't! 2003 saw the release of *Dominator* by Renga Media. This is a CGI animation film based on the Kodansha manga series of the same name. It was released on DVD after a limited cinema run, which included screenings at Cannes and the UK Festival Of Fantastic Films, where it scooped the Best Animated Feature award.

Dominator cost a fraction of the luxurious budget enjoyed by *Valiant*, but that doesn't preclude the fact that we got there first. Anyone in any doubt should take a look at the Renga Media website (www.rengamedia.com) for details, or check with the good people at Screen South. Credit where credit's due, pigeon people!

Tony Luke | Renga Media Ltd

We confess: this isn't the fault of Vanguard Animation's publicity



● Renga Media's *Dominator* is actually the UK's first full-length CG film. It's kind of like *Valiant*, but with guitar-wielding demons instead of the cute, talking pigeons

department. On our Next Issue page in Issue 62, we described *Valiant* as "the UK's first ever all-CG movie", prompting Tony's letter. Given *Valiant*'s wider cinema release, for our behind-the-scenes article in issue 63, we amended that to "the UK's first major CG movie".

RETURN TO BLENDER

➤ As an avid reader of *3D World* and an enthusiastic user of *Blender*, I just want to nag you into taking a fresh look at this open source 3D package. There have been a great number of additions to the software recently, including HDRi support (via the render extension *YafRay*), GI lighting, support for Normal maps, and a start at introducing support for soft bodies.

I really think it's worth a try, and like all the best things in life – including speech and beer – it's free.

Karl Laidlaw | Via email

➤ I'd like to say 'bravo!' for having started to include *Blender* in your Q&A section. I've been using this software for about four months and have found that the paucity of tutorials has held back my progress. *3D World*'s contribution to the sum total of *Blender* knowledge is a welcome sight!

Omar Marquez | Via email

➤ Re: the new buyers' guide in issue 62 of *3D World*. In my opinion, open-source products also deserve a place in

this list. While it may not yet have all the advanced features of *Maya* or *3ds max*, *Blender* is used by many professional and amateur artists, and fully merits a place in the 'All-round 3D packages under £250' category.

Winfried Dobbe | Via email

Do we detect a theme emerging? While we do rotate the applications featured in our Q&A section each issue, *Blender* is now a regular fixture and will return again in issue 67. Since space in the buyers' guide is limited, we initially chose to prioritise commercial products, but we hope to introduce new sections in future.

FREE TUTORIALS

➤ Although I'm currently a computer science student, I seem to spend most of my time working on my 3D projects. However, while the content of *3D World* is very useful, I often find it difficult to find the right tutorial in the right issue – my room is a little messy! It would be much easier if the tutorial text could also be bundled on the CD.

Also, I entirely agree with Mark Dziubczynski [Mailbox, Issue 63]: audio additions to the disc would be great! How do we start a campaign for this?

Kent McClymont | Exeter University

If we get enough emails requesting them, we'll certainly start including audio files on the CD. Going back to your first point, PDF versions of



● Tutorials from previous issues are now available in PDF format from our new website. Some are paid downloads, but if you're a subscriber, you'll get them for free

previous *3D World* tutorials, complete with supporting files, are available from our newly redesigned website, www.3dworldmag.com. Some of the files are paid downloads, but if you're a subscriber to the magazine, you'll get all of them – plus content from our sister magazines *Computer Arts*, *Computer Arts Projects* and *Mac Format* – absolutely free.

Although the archive is still fairly small, new tutorials will be added to it each month. For more information, take a look at page 98.

The state of your room, however, is completely beyond us...

ERRATUM

On the first page of Issue 64, we incorrectly stated that our cover image was rendered by Scott Willman. In fact, Scott was responsible for rendering the accompanying animation on our CD; the illustration was entirely the work of our featured cover artist, Darren O'Agostino. Copies of the issue, including Darren's excellent tutorial on recreating the image, are still available from our back issues department.



● Our cover image from issue 64, created in *RealFlow* and rendered in *Maya* by Darren O'Agostino

Your feedback | MAILBOX

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SPECIAL THANKS THIS ISSUE

Oliver Ponsommet, Jonathan Cole, the health-giving powers of coddles

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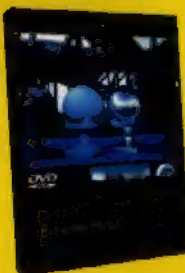
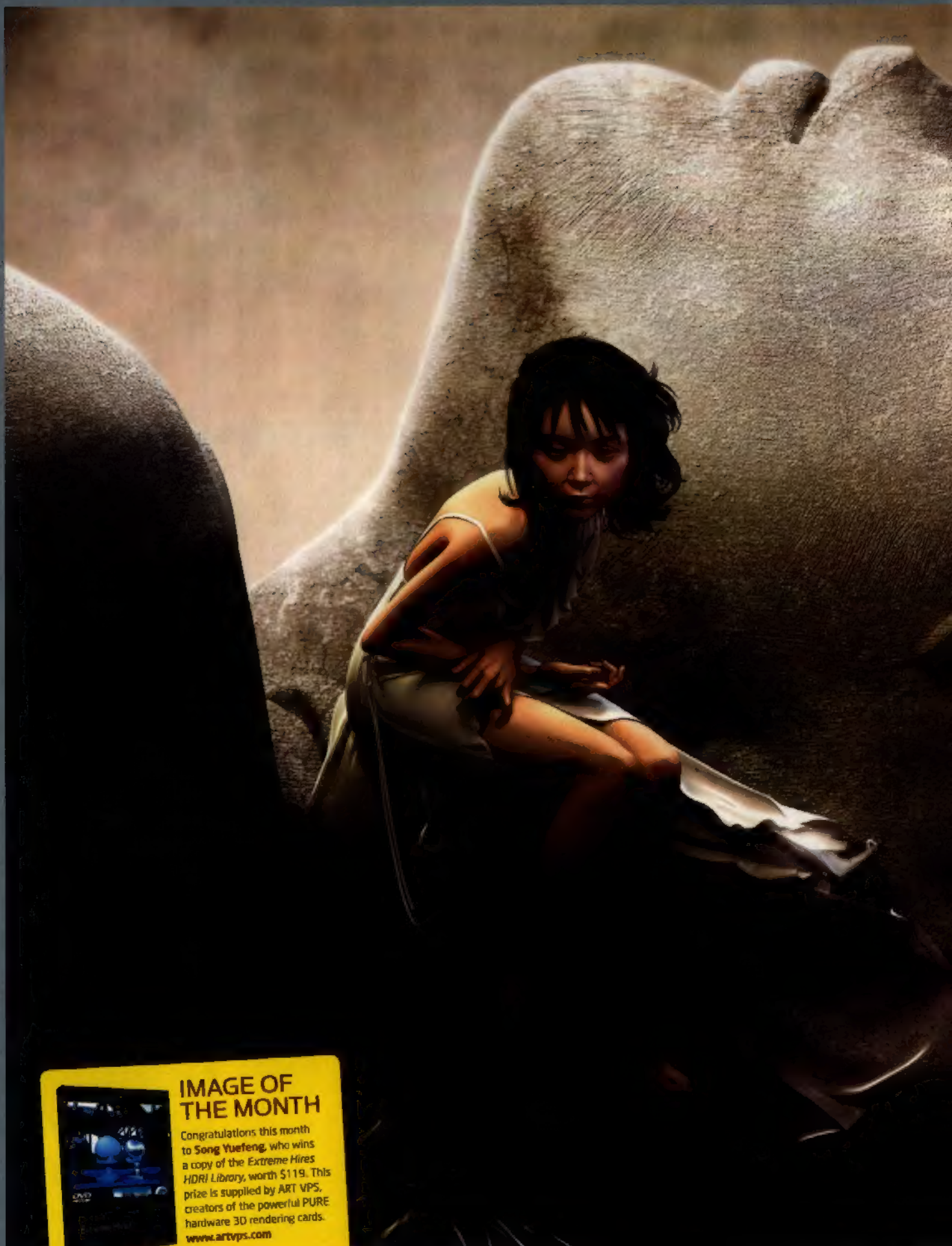


IMAGE OF THE MONTH

Congratulations this month to Song Yuefeng, who wins a copy of the *Extreme Hires HDRI Library*, worth \$119. This prize is supplied by ART VPS, creators of the powerful PURE hardware 3D rendering cards. www.artvps.com

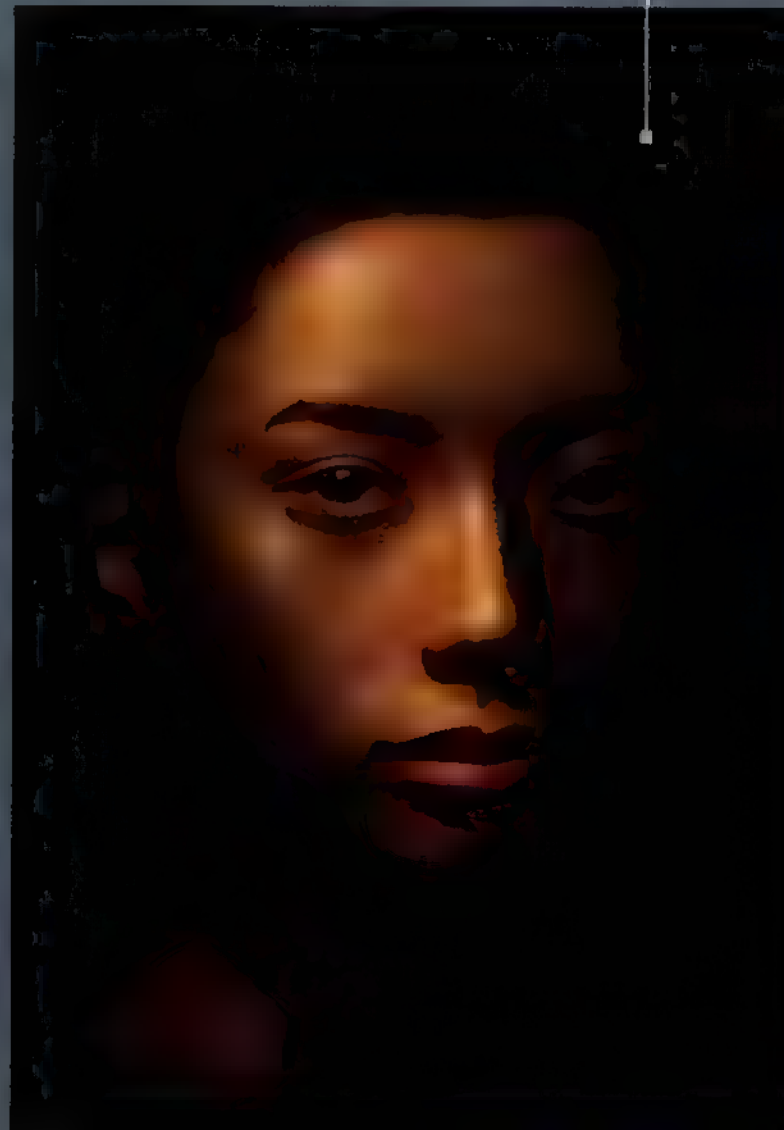


SONG WUJENG 吴敬 (China)

3ds max 5.1, Brazil 1.0, Photoshop

I'm a 3D artist at a small animation studio in Shanghai. I was educated mainly in painting and have been influenced by that in my CG career. I love the unlimited space of CG, and am very fond of creating such images. In the future, I'd like to create more CG animation that people can identify with and get emotional about. I intend to expand my artistic skills and explore areas of CG I've not yet tried and work with a wider range of ideas.

www.renderosity.com





EXHIBITION

Send us your exhibition images | For postal address, see page 9





3D MAX 6. V-Ray. Photoshop

"I've always found '50s sci-fi movie posters really inspiring. Just one image can tell so much - the film's story, the mood, the action, style and location. I came up with my illustration. It was modeled and textured in 3ds max 6, rendered with V-Ray and then touched up in Photoshop."

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RENDEROSITY: Maya and her Child, Hearts

Poser

The 17 years old and have been drawing since I was old enough to hold a pencil. In May 2000 my husband bought me a computer so I have something to do when I'm away from home. I enjoy using 3 Poser and was hooked on some great work that they work from my heart. I love fairies, fantasy and mood pictures.

For more information visit:

www.renderosity.com



RENDEROSITY: Memories

Poser

Since my childhood I've tried to paint my dreams. As a young girl I used to teach myself different techniques. In 2000 I bought a computer and found my first 3D program, Poser. I also use Vue d'Earth, Poser and Photoshop. I experiment with Photoshop. I've been in my studies. I've worked as a service artist since October 2001 creating book covers, pictures for 3D games, picture blends as well as organizing my website.

For more information visit:

www.renderosity.com



Call to artists!

You are invited to send in submissions to be considered for publication in *Renderosity: The Best of Digital Art*, scheduled for release in Spring of 2006.

Remember: you will have the unique opportunity to be published

In a high-end art book with worldwide distribution. Copies will be sent to at least 2,000 ad agencies in US and Europe with your contact details. All published artists will receive a free hardback Collector's Edition. For more details visit www.renderosity.com/book

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Check out our extensive selection of professional products for all the popular core software programs such as: 3ds max, Cinema 4D, Vue, Bryce, Rhino 3D, Softimage(XSI), Maya, LightWave, Poser, Carma and others.

3D models: humans, animals, monsters, home and office architecture, vehicles, clothing, furniture, props and more

Seamless textures: masonry, rocks, stonework, roofing, metals, ground cover, fabrics, skies and backgrounds
Join and receive 10% off your first order

Sign up for our weekly newsletter, and receive additional money saving offers and free products! Visit www.market.renderosity.com

FRANCO FERANTUCCI 1,2,3 Rhino

"I'm a 22 year old car freak from the Netherlands and have been working in 3D for eight years. Everything I've made about Rhinos has been and still is on the renderosity website."

www.renderosity.com/artist/franferantucci

FRAN FERANTUCCI



J. THOMPSON, HDR Challenge 1 Imagine 3D

"I got involved in CG in 1993 when *Imaginica 2* came out and CG came. I was really thrown into the spotlight. I was instantly hooked."

jthompson@redream.net
www.renderosity.com/homepage



THE BEST OF RENDEROSITY' DVD

Available in the Renderosity Marketplace and at Amazon.com for only \$9.95!

This dynamic adventure will show you artistic visions in a new light.



PRE-VIZ

NEWS / OPINION / ANALYSIS



Winning the next generation game

GAMES INDUSTRY The looming next-generation games console war has also inevitably started an arms race among the 'Big Three' 3D software developers. Which of these apps is best-placed to prevail?

PLUGGED IN

ESCAPE COMP

UK CG training specialist Escape Studios has joined forces with a number of big-name post facilities to offer ten lucky students specialist training for free. The VFX Production Grade course will start in September, and offer five months of tuition using Maya, Shake, mental ray and RenderMan, plus a two-month work placement at a top facility. The course has been organised to make up for the perceived shortfall of UK CG talent in the industry. Contact Escape Studios by calling +44(0) 20 7348 1920, or email vfxpg@escapestudios.co.uk to find out more. www.escapestudios.co.uk



Escape Studios

Developers of 3D software, like confident fathers of the pride, usually react to the intrusion of other large animals on their turf with little more than a dismissive flick of the tail. Yet Avid's recent discount offer to 3ds max users to trade up to XSI (see page 18) suggests the territorial lines are finally being crossed, as the big three lick their lips at the spoils of next-generation games development.

Industry expert Robi Roncarelli points out that in the current games market, 3ds max has the largest userbase, followed by Maya and XSI. But will this always be the case? Autodesk, makers of the newly rebranded 3ds max certainly thinks so, and remains bullish about the future, pointing to its viable business model and its continued commitment (as one of the world's largest software companies) to innovation. "We're putting more development into the core for the games industry than any other 3D tool," said Autodesk's Patrick Jocelyn, asking "If you were to embark on a new £10 million development project, would you trust a tool with less foundation than this?"

Foundations, or rather cores, are also part of Alias's agenda – the company claims that it's the only 3D tool company to have added engineering talent over the past two and a half years, and also points to the purchase of Kaydara and MotionBuilder as a sure sign of its commitment to the games arena. "Games companies have identified pre-production as the critical area for greater investment in next-gen titles," said Geoff Foulds of Alias. "They want to spend more effort in pre-production, and do more in 3D: MotionBuilder is the right tool at the right time."

And what of Avid's PowerUp offer? Autodesk dismisses it as a desperate measure: "It seems Avid is desperate to make up for business they lost when it lowered its price without being able to pick up new customers." Avid defends itself by asserting that "We got a great reaction from the user community at GDC. We get frequent feedback from the user community that it will be difficult if not impossible to be productive by using 3ds max to create content for next generation games." Alias is keeping out of the catfighting altogether, preferring to emphasise that "Maya 6.5 is a substantial refactoring of the core of Maya, so it can scale to handle the demands of content for next-generation consoles."

DON'T WORSHIP FALSE GODS

Yet when asked for any hard evidence of migration from one platform (and attendant pipeline) to another, the developers opine that of

course there is – it's just no one can talk about it. Autodesk does, however, caution that its competitors have in the past made claims to studios that are still established as 3ds max pipelines.

So we're all going to have to take the developers' word for why their product is best-suited to the

demands of next-generation games (covered in our feature on page 32). Autodesk focuses firstly on the quality of its toolset. "Our Normal mapping tools are superior to all others, and our vertex painting, lighting and baking tools are perfectly tailored," said Jocelyn. Stability is the next advantage Autodesk claims for max in the next-gen arena. "Next-gen consoles will allow for much bigger data sets and visual fidelity. In preparation for this, the last two releases of 3ds max have had heavy focus on scalability, workflow and speed.

"GAMES COMPANIES SEE PRE-PRODUCTION AS CRITICAL: THEY WANT TO DO MORE IN 3D"

GEOFF FOULDS, ALIAS



Autodesk's 3ds max still has most seats in the games industry, but Maya attracts prestigious AAA clients. And XSI has made a play for 3ds max's userbase with its recent PowerUp offer.

TALKING POINT | In three years' time...



"The Avid CG environment will have evolved considerably. The XSI artist will very likely be working as part of one of these large teams, and the XSI toolset will form an integrated piece of a wider CG production network. You're unlikely to see this efficient, team-based product on par with the same timeframe from other vendors as they simply don't have the support and resources of a media company like Avid to draw from."

Gareth Morgan, Senior Product Manager, Softimage/XSI



"Artists will need to work on scenes that are much more massive than today. Alias has refactored the Maya core over the past several releases, especially so with G5. We've put the foundation in place so that Maya will scale to meet the needs of these massive datasets. It's this sort of pipeline solution that our customers tell us they need."

Geoff Foulds, Industry Business Development Manager, Games - Alias



"More than anything else, users will be glad because they'll have a tool that is perfectly tailored for their work and product on schedules. They'll be able to ship on time. Using 3ds max is their greatest assurance that they can deliver a high-quality product and stay in the game. No other 3D tool has 3ds max's track record of involvement in shipping quality titles. That won't change with the next generation of game consoles."

Patrick Jocelyn, Director - EMEA, Autodesk Media & Entertainment

noticeable in areas such as our rigging tools, and memory management." And finally, close involvement with the major developers themselves is of paramount importance. "We have close relationships with all three major hardware vendors. Our engineers speak to each of them on a regular basis to ensure that we build appropriate tools for their hardware. We've been working with Sony on the COLLADA initiative since its inception, and we support Microsoft's XNA announcement."

Alias instead focuses on extensibility – the ability to customise workflows to particular projects with the minimum of time and effort – as an area where Maya excels. "The functionality of a 3D tool out of the box is just the beginning; game developers need a stable platform for adding custom functionality," said Foulds. "And game developers say that, for extensibility, Maya is the best choice. Its patented Dependency Graph, with its integrated API and scripting

make Maya the most stable development platform. And all the custom tools conform to Maya's user interface paradigms, so the huge base of Maya talent can easily step into a project either internally or as part of an outsource studio."

Gareth Morgan, XSI's Senior Product Manager, emphasises overall production workflow as an area where XSI excels. "As interactive entertainment media matures, what emerges as a primary challenge facing games developers probably relates more to production and asset management than to either new algorithm or rendering technology," he said. "XSI isn't just 3D software, but part of a larger CG production framework that's designed to address these emerging challenges." Perhaps they should all just have a game of the next Unreal Tournament to settle it. But then which 3D application will have been used to create it?

www.discreet.com / www.alias.com / www.softimage.com

FEEDBACK

We want to hear from you on the issues affecting 3D artists, so from now on, once you've read our main news story on the facing page, why not visit our forum and post your reaction to it online?

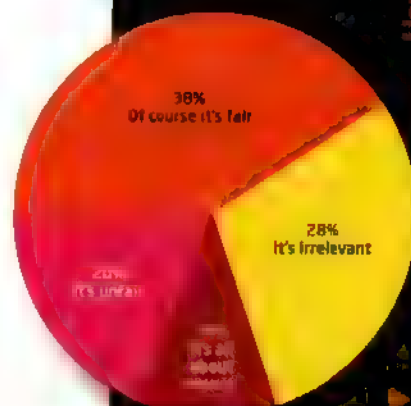
This issue's question concerns which of the big three 3D software apps is going to fare best in the emerging world of next-generation game development. Have pipelines already been put in place, and has the industry already picked a winner, or are companies even now looking at their artists swearing at their software, and thinking 'Is it time for a change?'

Which of the big three 3D applications is likely to dominate next-generation development?

- 3ds max – It's the most established, and there's always safety in numbers
- Maya – Films and games are converging, and Maya is highly customisable
- XSI – People will vote with their feet, and realise that XSI's assets and ease-of-use will prevail
- None of the above's! LightWave rocks!

LAST ISSUE: THE VERDICT

"Is it still fair that mighty animation giants like Pixar compete directly for Oscars with independent filmmakers on shoestring budgets?"



Have your say | <http://forum.3dworldmag.com>

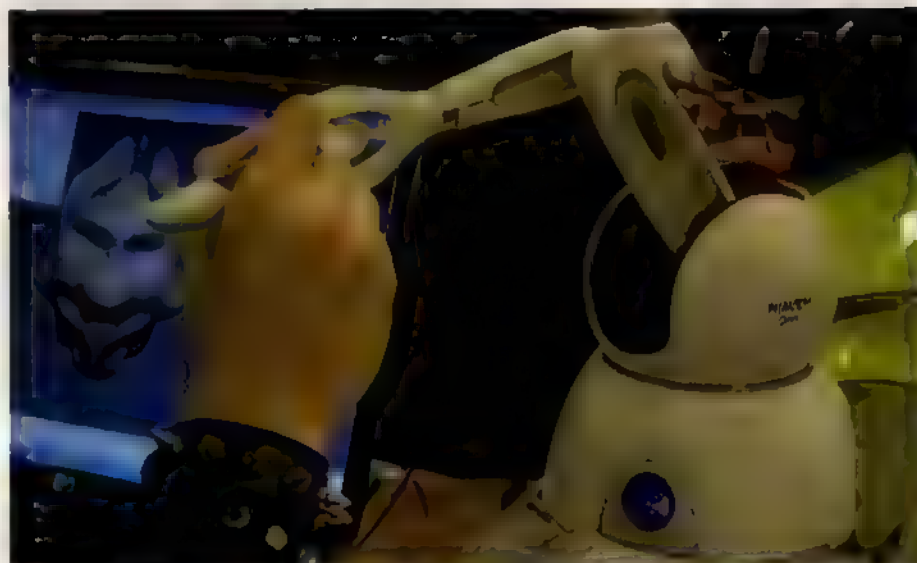
GDC 2005: The calm before the storm

SHOWREPORT March's Game Developers Conference saw tools companies showing how they'll be facilitating the creation of next-generation games, while trying hard not to let the cat out of the bag about new console tech

Characterised for a second year running by the absence of hard announcements from Sony, Microsoft and Nintendo, GDC 2005 proved to be a reflective experience. Those studios valued enough to be on the inside track for PlayStation 3, Xbox 2 or Revolution were either working too hard to attend, or remained resolutely tight-lipped and coy about the information they were privy to. In such an information vacuum, the show's action shifted to tools companies. Quietly showing off their re-architected products, but not being too specific about low-level changes, these companies entered into a fascinating game of cat-and-mouse that was particularly evident among rivals keen to position themselves at the cutting edge.

Most notable were the usual suspects – Autodesk, Alias and Softimage. All were taking up the ability to robustly handle huge datasets, as well as acting as the backbone of next-gen game development, thanks to support for myriad file formats, assorted plug-ins and asset management backends. Publicly seen for the first time, Discreet demoed *3ds max 7.5*, a subscription-only release boasting an integrated hair and fur system. The company also demonstrated some future goodies, although these were only shown to VIPs under NDAs. Alias promoted the tight integration of character animation package *MotionBuilder* with *Maya*, and announced the free availability of an SDK for the FBX file format. A cheeky Softimage took a more commercial approach, offering *3ds max* users a trade-up package to persuade them to switch to XSi for an attractively reduced price.

More technically innovative, however, were the smaller vendors. NaturalMotion launched version 2 of *endorphin*, its intelligent character animation toolkit. This new version adds the ability to multi-layer behaviours, and has integration with Alienbrain. RTZen's *RT/shader Ginzai*, a real-time visual shader creation tool – already being used for next-generation games – caught the eye, while Luxology's *modo* subdivision surface



modelling tool was another new entrant that looked well positioned to establish itself in the industry in the future.

Also heralding a shift to more film-style workflow was SensAble, a US-based developer of touch-enabled 3D modelling tools, which

demanded the combination of its *ClayTools 3ds max* plug-in with the Phantom Omni haptic device. Labelled a "virtual clay modeller", the combo enables artists to create high-resolution meshes that can be baked down to real-time models. These skills will prove to

● SensAble's virtual clay modeller, complete with haptic controller, was just one example of the tools aimed at helping artists raise the quality of their assets

THE TOOLS COMPANIES ENTERED INTO A FASCINATING GAME OF CAT AND MOUSE

be essential for generating the dense art assets required by the next-generation consoles – assuming that they're finally announced during May's E3 expo, of course.

www.gdconf.com



● Competition between 3D vendors was fierce at this year's GDC, with Softimage targeting *3ds max* users in particular

PlayStation 3 | Inside the Cell

Sony may not have said much about PlayStation 3, but it did shed some more light on the console's revolutionary Cell CPU. Each one consists of nine basic components: a 64-bit multi-threaded PowerPC core, acting as a control chip, and eight 128-bit general processing units, which are connected together by a high-speed bus. These

relatively simple chips are designed to process massive arrays of data in parallel. Indeed, the only question left unanswered by the presentation was exactly how many Cells each PlayStation 3 would contain.

"This is just one version of Cell. We can use Ns and Ms of these components," joked SCEA's Manager of Developer Relations, Mark Deloura. The good news, however,

is that it will have a relatively robust tool chain, something not offered in the case of PlayStation 2. Sony will use OpenCL ES (a cut-down version of the cross-platform graphics API), Nvidia's Cg for shader creation, and establish COLLADA (COLLAborative Design Activity), a new open source file format that enables 3D tools vendors to ensure the interoperability of assets.



● As well as tools vendors, hardware companies such as Nvidia also demonstrated how their smarts will aid next-generation game development



Escape Studios

What happens when five of the UK's biggest post production houses join forces with one of the world's top CG training facilities?

The VFX | Production Grade is an intensive 7-month course comprising 3 months of full-time training at Escape Studios and 2-months working at a major UK post house. Put simply, there is nothing else like it in the world. The course will take

10 students to production readiness in order to provide the participating companies with the very best very talent available. Call +44 (0) 20 7348 1920 or visit us online at www.escapestudios.co.uk to find out more.

CineSite
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FRAMESTORE CFC

double negative visual effects

The Moving Picture Company



Autodesk toxik: tracking the changes

toxik is a database management and workflow tool that promises to make collaboration on large projects easier and faster. But will it rock your world? Autodesk's Patrick Jocelyn thinks so.

toxik's a bit of a departure from the fire metaphors...

Naming a new product is incredibly difficult - you end up with a list of ten possibilities and hope you can get one registered.

How long has it been in development?

It's gone through a couple of years of client interaction, under NDA.

How does it work in practice?

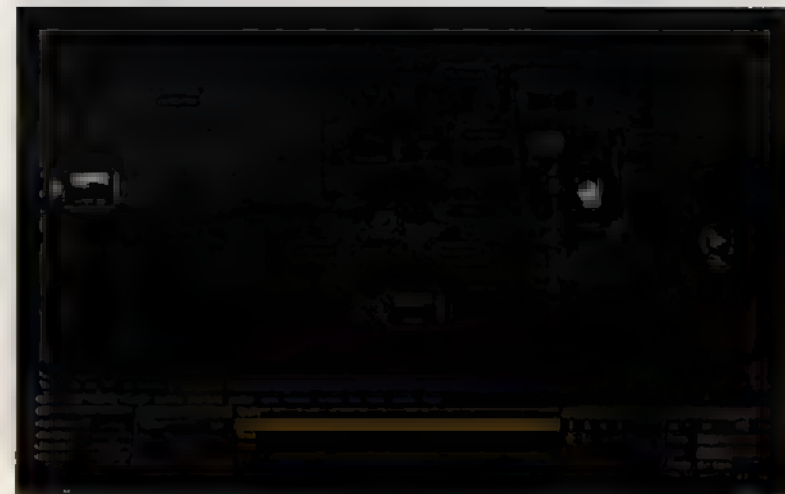
If you're working in 3ds max and you're rendering out images, typically you need to know how they're going to be graded so you can give the appropriate 8, 10 or 12 bit image to the compositor to incorporate into the scene. Often these 3D elements need to be re-rendered, then recomposited, which might happen a few times, producing bits of different versions. And because it's not just one person doing it, you can really get hung up with whether the version you're working on has the latest 3D or 2D background, model or other quite subtle changes. If you're part of a 50- or a 100 person team, it becomes an administrative nightmare ensuring you're working on the latest versions. With toxik, the task becomes practically automated - you don't need intervention from an admin person. The changes are noted in toxik's Oracle-based database and auto-tracked. Hit a button and all the latest versions are incorporated.

So when is it a particular advantage?

Where four or ten people are working on a sequence that's very intensive with lots of new info coming through or being changed, right throughout to the point where that final scene is done, no one has to worry about the collaborative admin because they're all automatically updated with everyone's changes.

People will still be collaborating on huge datasets at high resolution - is there really no noticeable lag?

toxik genuinely offers a unique way of dealing with those datasets. Most products have to load the whole dataset, with toxik, the operator only uses what he needs to look at, so if you're zooming into a part of a complex scene, the product's only loading what the screen is displaying. Rendering remains a background process. One important factor is the way the code looks at images. There are hardly any apps that you can load a 32-bit floating image directly into; usually you take those images into a number of different views. With toxik, you load the whole 32-bit float in, with full dynamic range control.



ABOVE toxik's integrated file and metadata sharing enables large datasets to be broken up into component parts, which can be independently worked on by a number of artists

What storage benefits does toxik offer for film production pipelines?

The way we store images is that if we've got the original footage, we don't need to duplicate that. Instead, we store the metadata of the changes that are on top of those images. So essentially, you're storing two sets of data: the raw stuff, and the end result.

What are the specific benefits for the 3D artist?

In a nutshell - more time is spent on creative work, less time on the administrative work.

Are you concerned that someone will come out with a solution that will do the same job but cheaper?

I think people are years away from this. By the time our competitors catch up we'll be well established in the market. Our competitors are still focused on that 'hero suite' - you know, that single seat with everything on it - and they're not focusing on collaboration.

What percentage of companies on the beta programme will take it up?

I'd say almost 100. Many have seen the value of the product, so there'll be a very fast transition from the launch to the take-up of it.

How can you be so sure it'll catch on?

The thing that makes me sure toxik will be a success is an analogy that came from one of our beta customers. They said, 'All the tools we currently use for these productions, we don't really know if we're profitable - we can only have a wet finger in the air as to whether we made money or not. With toxik, we know exactly how much was spent on every shot.'

So it's bad news for slackers...

Well, it'll give you any data, so you can cost a job accurately. You know how many rendering processors were utilized for how many hours, how much time it took on the network, how many people requested to use the data, etc. The Oracle database does 20,000 transactions per second - all that data is stored as metadata.

Will games be next in line for the toxik treatment?

Films and TV is our launch pad, but games pipelines look very similar to film pipelines. toxik is a fundamental database and workflow management tool; clearly the opportunity is there for us to go into a lot of different markets that have huge datasets, and complex collaborative workflows. It's just a question of what tools you need to use on it.



Patrick Jocelyn is the Director - EMEA at Autodesk



Many illustrious companies have been involved in beta-testing toxik including Animal Logic, Cinesite, Das Werk, Framestore CFC, MPC, The Orphanage, ESC and Weta



toxik consists of three components: Creative (the artist's tools and views); Collaboration (enabling interactivity); and Utilities (supporting tools)



WEBSITE OF THE MONTH

www.fragilemachine.com

IT ISN'T EVERY DAY that a 3D short aspires to the loftier end of the intellectual plane, but that's what we have here, with Airlane's site showcasing its "underground CG film" *Fragile Machine*. The film tells the story of the first girl to be built in a factory instead of born from a woman (the second, if you count Jordan). Asking questions about regarding her creation. Why was she made? Does she have a soul? Where would she go if she died? Science, religion, and "man's role in a new nature of which he has partial authorship" are themes explored by the movie, which some have likened to an electronic *Symphony*, no less. Visit the site to see a trailer and stills, and find out more about the collective's art and music.

Further sites...

www.cgtrading.com

Well eBay, set your heart out - here's the CG equivalent, albeit on a slightly smaller scale. But you never know... Visit the site to sell your unwanted 3D training software, stick a model two up for auction, and hunt for bargains in a variety of categories.

www.3dbuzz.com

The online home of the legendary 3D Buzz has received a spring clean. The site now offers a much simpler 3D Buzz experience - and there's now free access to 3D Buzz's own BuzzNet Radio Show. If you fancy delving into the mind of the 3D Buzz crew...

LOCK & LOAD COMP

COMPETITION Avid offers modders \$25,000 in prizes

AVID'S SOFTIMAGE|XSI Mod Tool Lock & Load challenge is offering over \$25,000 in prizes to the best games characters, props and scenes created by modders using the free XSI 4.2 Mod Tool.

Judges will be looking for original, compelling characters that can be exported into supported games like *Half Life 2*, *Counter Strike*, *Source* and *Unreal Tournament 2004*. The criteria is based on visual excellence and animation quality; efficiency of geometry, texture maps and animations will also be considered.

Three winners will receive an HP xw9300 workstation with a professional licence of XSI. Other prizes up for grabs include Nvidia Quadro FX 7400 graphics cards, copies of XSI *Foundation*, training DVDs and books. The closing date for entries is 1 July 2005. See the site below for entry info.

www.softimage.com/challenge



IMAGE © Bryan Eppenhart

Do more for less.

"On *Supervolcano*, **SOFTIMAGE|XSI** particle effects allowed us to refine and integrate CGI with live action, achieving a totally believable organic feel for the pyroclastic flows. **SOFTIMAGE|XSI** also enabled us to 'un-zip' canyons; to build 'Virgil' the holographic model accurately and create the helicopter for certain scenes".

Grahame Andrew
Visual Effects Supervisor, Lola

Available at
store.softimage.com from

£299 (ex VAT)



www.softimage.com

Supervolcano is a BBC / Discovery / ProSieben / MeHaset / NHK production for BBC ONE. Lola, 14-18 Great Portland Street, London, W1W 3QW. www.lola-post.com.

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Avid.
computer graphics

Projects round-up

Invisible charity, students in Ferraris, imaginary robots, Who, and promo fun

01 STUDENT DESIGNS ON FERRARI

Alessandro Debenedetti, Emiliano Fiordi, Marco Francesconi and Pierpaolo Garripoli designed a Ferrari at Italy's School of Architectural Technologies and Design for their final project—and were offered cooperation from the motor company itself. "We designed the entire model, using CADs max including the interiors, the rims and the engine space, working for three months," says Francesconi. The next steps technically are to create a blueprint for a model dubbed the Air new. Three students have gone on to set up their own company, J&K Design. Ferrari may even build the car for real. www.dgfdesign.it

02 MILLY'S DOCTOR WHO EFFECTS

The first series of *Doctor Who* since 1989 presents viewers with a new Time Lord, a new assistant, and a record-breaking number of visual effects shots created by M. I.T.V. The 13 episodes feature 1,300 in all, including a new title sequence, CG aliens, and a spaceship crash-landing in the Thames. "There has been something special to tackle in each episode, but if I had to choose a particular favourite, it would be the spiders in episode two," says VFX Producer W. I. Cohen. "They're fully CG animated characters, with a real air of menace about them." www.themilli.com, www.bbc.co.uk/doctorwho

03 FRAMESTORE CFC CHEMICAL BROTHERS VFX

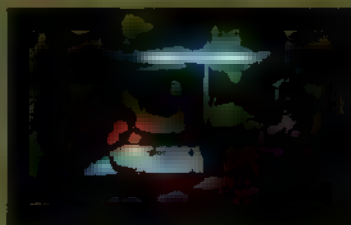
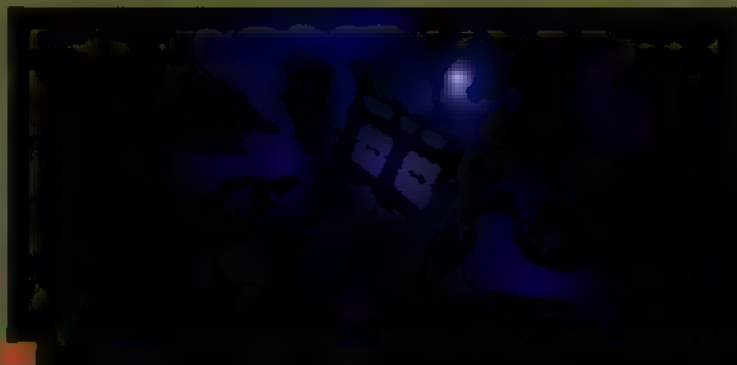
Robots of a less cuddly kind than the Blue Sky variety roam London in the latest Chemical Brothers vid, *Believe*. Framestore CFC worked on the video, which depicts a car factory worker doubting his sanity as a rogue production-line robot arm pursues him. "With over 30 shots to do in a very short time, an iBL and mental ray set-up meant everything would be in one beauty pass," says Head of 3D Communications Andy Boyd. Using a very slow, low pass and a special multi-light pass, the compositing team seamlessly integrated the 3D elements into the DV shot footage. www.framestore.cfc.com/press/05Spr/050323chemical_brothers

04 NEW JONAS ODELL MUSIC VIDEOS

Stockholm-based Jonas Odell, the director behind Franz Ferdinand's Grammy-nominated *Take Me Out* promo, has two new works currently airing. *Changes* by Tahiti 80 uses animation to create a retro '60s feel, while the video for Feeder's *Feeling A Moment* features the director's signature mixed-media collage style, blending 2D, 3D and live action. "I wanted a way to reflect the sadness and sense of isolation, as well as the euphoria of the track," Odell says. "so I let the realistic environments melt and explode into graphic shapes that could reflect the emotions." www.nexustondon.com

05 MPC'S EFFECTS WORK FOR WOMANKIND AD

Few ads are as dark and confrontational as *Be There*, created by the charity WomanKind. Worldwide, in just 60 seconds, it depicts an African girl about to be cast into an attempted rape, and a woman subjected to spousal abuse. In all three cases, an unseen force—representing the charity itself—intervenes, and the 3D effects used to depict this invisible helping hand were provided by Moving Picture Company. Tasks included lighting and particle effects, 3D set elements, and the deformation of a CG arm, as well as substantial rig removal. www.movingpicture.com, www.womankind.org.uk





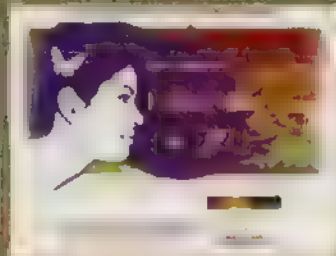
EVENT HORIZON



E3 2005
17-20 MAY, LOS ANGELES, USA
The Electronic Entertainment Expo returns to the Los Angeles Convention Center in May. 400 exhibiting companies are expected to show off the latest games and technology, and the conference lineup is packed, as ever.
www.e3expo.com



ONEDOTZERO9
27 MAY-5 JUNE, LONDON
London's ICA plays host to onedotzero's annual celebration of the moving image. All kinds of digital film and animation are represented, with everything from game graphics to promo work on display.
www.onedotzero.com



VISIONFEST
2-5 JUNE, INDIANAPOLIS, USA
This North American student festival aims to support the development of animation, new media and interactivity by providing an environment for students to meet industry pros, discuss work and exchange ideas.
www.visionfest.org



SOHO SHORTS
30 JULY-5 AUG, LONDON
The seventh Rushes Soho Shorts Festival invites you to submit your work for entry. You have until Friday 6 May to book your film a ticket to London for possible inclusion in this week-long celebration of short films.
www.sohoshorts.com

SpacePilot takes off

HARDWARE The latest motion controller from US purveyor of peripherals 3Dconnexion aims to redefine the way you interface with your computer

Just look at that mouse dangling out of your computer like some limp, dead, obsolete thing isn't it pathetic? What was once actually considered a 'cute' peripheral by secretaries up and down the land has become a monstrous straitjacket to creativity, imprisoning the aspirations of many a 3D artist within its cheap moulded plastic chassis. There has to be a better way. There just has to be.

Peripheral manufacturer 3Dconnexion thinks it has the solution with its innovative SpacePilot motion controller. The company aims to prove that two-handed manipulation offers more control and sensitivity than conventional methods – and produces results faster. Promising to 'eliminate half of all mouse movements' through a combination of ergonomic design, intelligent programmable keys and an adaptive LCD display, the SpacePilot also promises to 'reduce trips to the keyboard' – an undoubted bonus to those hordes of miniature 3D artists wearily contemplating another journey keyboard.

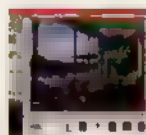
But 3D artists of all shapes and sizes should be intrigued to find that using the SpacePilot in their left hand to navigate around scenes frees up their right hand for other important business such as selecting and editing. And the 21 speed keys (which either offer pre-programmed functions or can be user-defined) offer a new dimension of control. 3Dconnexion claims SpacePilot users will benefit from a 30 per cent gain in efficiency over just using a mouse, while simultaneously reducing the strain and repetitiveness associated with 3D design work. SpacePilot is currently a Windows-only device, and costs \$499.
www.3dconnexion.com



● 3Dconnexion's most advanced motion controller to date offers efficient navigation, advanced ergonomics and intelligent keys

Production line

The month's other releases in brief



PIRANESI FOR MAC
Version 4 of Piranesi, the 3D painting software from Informatrix, is now available for the Mac. Offering support for Archvision RPC content and over 300 new cutout and texture images in the Piranesi library, Piranesi 4 costs £450 (exc. VAT).
www.informatrix.co.uk



CRAFT SPACECAM FOR MAYA
Sweden's Craft Animation has shipped Craft SpaceCam for the PC version of Maya. The plug-in enables users to record real-time camera movements using a joystick, for outer-space flyby shots worthy of a big-budget sci-fi film. SpaceCam costs \$99.
www.craftanimations.com



PFTRACK 3
The Pixel Farm has released version 3 of its flagship camera tracking app. PFTrack Version 3 adds 30 new features including advanced object tracking, geometry tracking, editable F-curves, and automatic Z-depth extraction. See our full review next issue.
www.thepixelfarm.co.uk



VECTORSTYLE 2
Eovia has released VectorStyle 2, a new plug-in for Carrara 4 enabling users to render scenes and 3D animations in formats such as SWF, EPS and SVG. Rendering now supports shadows from multiple light sources and transparency. VectorStyle 2 is £90 (exc. VAT).
www.eovia.com

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Prey for indie success

FILM The digital techniques pioneered by *Sky Captain and the World of Tomorrow* form the basis for new independent short film *Prey Alone*



While Hollywood cautiously waits to see if comic book translation *Sin City* can succeed where *Sky Captain* blazed its modest trail, a small team of Irish filmmakers has released a much lower-budget greenscreen epic. *Prey Alone's* 15 minutes of action movie eye candy boast 350 effects shots, featuring production values closer to those of million dollar blockbusters. In fact, it cost a mere €80,000, with funding from Ireland's Film Board and RTE. The plan is to sell the movie to numerous television markets through Network Ireland Distributors.

Industry veterans James Mather and Steven St Leger headed up a team of six, creating the entire feature in three months flat. "It was gruelling work," recalls Mather. "We didn't even have real-time playback, so Stephen would drive over every day to collect a hard drive, which would then be viewed at 2K in flame"

As well as making the project cost effective, the film's reliance on CG for all sets and effects also

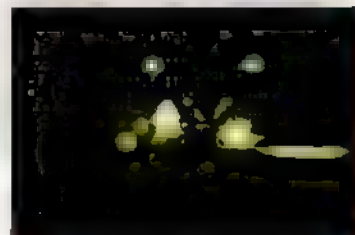
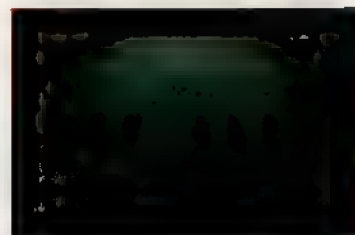
enabled its creators to let their imaginations run riot. This is most evident in the film's centrepiece, in which a Harrier aircraft speeds through a claustrophobic tunnel.

3ds max was used for all 3D work. "While the bigger packages are great for 'pipeline' effects, I think 3ds max is better for boutique work," says Mather. "We also used it for rendering, with raytracing for all the lighting. Working at 2K resolution meant that radiosity of any kind was out, but lots of soft area lighting creates quite a radiosity-like effect."

Mather admits that the large digital sets almost ground their humbly specced PCs to a halt, though thanks to George Lucas, the pivotal tunnel sequence proved less troublesome.

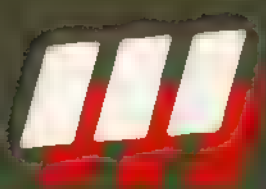
"We borrowed a trick from *Star Wars*, placing a digital mirror on the ends of the tunnel to extend them to infinity, without the need for lots of extra geometry," reveals Mather. "Necessity forces you to find hidden economies."

www.saintandmather.com



● A 15-minute, €80,000 blockbuster, *Prey Alone* was created in just three months. The film is entirely reliant on CG for effects and virtual sets. "We were completely unprepared for the horror of the 3D/post schedule," says Co-Director James Mather. "For a while, we really thought we'd bitten off more than we could chew"





Letter from Hollywood



Back in the old days, we used to note that there was nobody over 30 years old in production. At the time, this mainly meant television commercial production. One reason for this age anomaly was that the whole post-production extravaganza

was just getting started, so the people coming into it tended to be young. Another was that when people pass 30, they start getting interested in other things besides production. In particular, they begin cultivating hobbies such as getting married and having children, and family life has a tough time co-existing with 100-hour working weeks.

Feature films were a little different though. It was much less unusual to find people over 30 - and over 40 and 50 as well working in feature production. This is still the case, but since it's now been a whole generation since the introduction of CGI into feature film, some of those old facts are no longer just film editors, composers or directors - they are also effects supervisors and CG supervisors and just plain CG artists in general. Which makes it worth wondering: is there now a career structure in CG?

Ten or fifteen years ago, the number of effects or CG shots in a film was still fairly small, and so the teams were too. This meant it was reasonable to expect that you would be able to progress to running your own team - to being a CG Supervisor, say - as the first rung on a ladder. But now, with hundreds of

Job satisfaction

Is genuine career progression still possible in today's CG industry, wonders **Craig Zerouni** of Side Effects Software, and are we having fun yet?

artists on a single show, and still only one or two CG supervisors, it's hard to see how there's much room for advancement. In turn, maybe this means that many people will have to accept a complete working life of sitting in the dark, trying to find a rogue polygon that's messing up frame 62, which may not be what they thought they were going to be doing when they left art college.

And now there are thousands of CG artists worldwide, working in feature films, television post-production and games. I've always been impressed by people who spend 40 or 50 years in film production - first because it's hard to have a creative career that spans that kind of time, and second, because that's serious dedication. It makes me wonder - what is the working life span of the average CG artist?

I ask because I've noticed a surprising number of long-time CG artists who have expressed some wistful notion of getting out, of getting a 'real job' of some kind. I don't know if this is just the kind of thing that people say after 20 years of any sort of work, or if the CG business is particularly bad at burning people out.

The burnout theory would hardly be surprising because most production is a fairly intense treadmill. Of course, for many people, that's exactly what a working life is - 45 years in the factory, banging out widgets. Fun doesn't come into it - it's a living. But this is supposed to be a groovier, more up-to-date way to make that living.

Perhaps the truth is that there's no escaping the relationship between work and fun. As Mark Twain wrote in *The Adventures of Tom Sawyer*: "Work consists of whatever a body is obliged to do, and play consists of whatever a body is not obliged to do." Despite that, this is still fun. But ask me again in 20 years.

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Avid
computer graphics



Close Up

Dyson 'Motion' ads

Dyson forgoes reality for the launch of its new vacuum cleaner, with The Mill creating swirling light trails and dynamically moving CG model elements instead

BY MARK RAMSHAW

While CG representations of washing powders, fizzy drinks and children's toys are commonplace, it's rare to see anything so blatant in an ad that targets an adult audience. In this niche, everything except the actual product is considered fair game for digital manipulation, but the item being marketed will always crop up *au naturel* at some point. Not so with the latest spot for Dyson's new vacuum cleaner. Three CG spots in all (one for the UK and two for the US) have been created, each relying solely on animation by Mill TV. "Due to the fact that it was all CG, with no live action, the chain of events that usually takes place was slightly reversed, which meant that The Mill was involved right from the beginning," says 3D Producer Satoko Inuma. "There was no agency storyboard as such, but Director Matthias Hoene presented a 3D animatic he'd made on his laptop."

The Mill's brief was to illustrate the flexibility and elegance of movement afforded by the cleaner's ball-based design. The idea was to make the CG animation look realistic but to keep it minimal, with the product placed against a black backdrop. "Dyson was very excited from the start about deconstructing the product to animate the components, in particular the ball, and this could only be achieved using CG," says Inuma.

The Soho studio worked closely with Dyson on the top secret project for several months, building a 3D model from the original CAD files. This data proved so heavy that The Mill's render files had to be re-written to cope with the workload, but the payoff was a workable, fully accurate replica of the real thing's inner workings, as well as its exterior. "Once we'd cleaned up the models, it was a very exciting challenge to work on this piece of engineered design, and to match the materials in a hyper-realistic way," says Inuma. "For the animation, we did make use of a low-res version of the model. Linked with the high-res model in *Softimage|XSI*, we just had to push a button before going in the farm and it changed from a pumpkin to a golden carriage - even after midnight."

To highlight the unique design, the ads depict a sort of reverse explosion, with an initial sequence featuring just the

ball mechanism, followed by all of the various cleaner elements recombining. All the while, the camera dynamically tracks the ball's path, with several illuminated trails streaking behind it to convey the sense of movement.

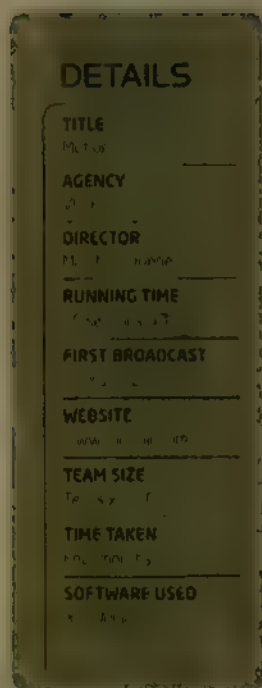
TRAILS ON TRIAL

3D Animator Laurent Makowski, who had previously applied static trails to an ad for Orange Mobile back in France, was assigned to handle this side of the project. The starting point was Point Track, a proprietary system originally developed by The Mill's R&D team for the 2003 Mercedes ad, *Movement*. However, when the director asked if it was possible to have animated trails, rather than static ones, it became apparent that a more flexible tool would be required - one that could handle trails that distort over time, with either random waving or dynamic behaviour, and with control over friction, amplitude, wavelength, scaling, twisting and thickness.

"I began to experiment with various 2D and 3D solutions, trying out things like particles and clothing systems," explains Makowski. "In the end, I wrote an *XSI* script that works with a bunch of 3D curls, rather than particles. This script then kept evolving as the project developed."

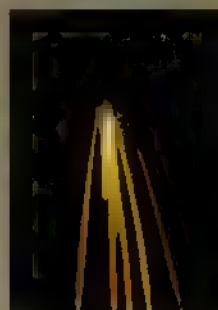
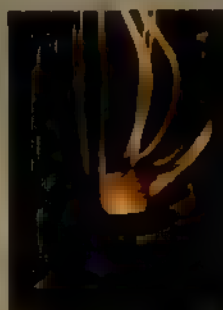
Further challenges arose with the need to produce three ads for two different territories. "There had to be a consistency in terms of the Dyson brand, but the ideas were very different between the UK and the US spots," says Inuma. "The look of the product was clear, so once we had the correct lighting set up, we could use this for all commercials. The trails actually had a slightly different finish in the ads for the US, though. Rendering multiple passes for the many trails and generating dozens of different versions and modifications was very time consuming. We had to stay focused throughout the many weeks of production; not just on one yellow ball but on many different ones. It was a little bit like juggling."

The new Dyson spots are currently broadcasting in the UK and USA. They can also be viewed at Beam TV. Find out more at www.the-mill.com and www.dyson.co.uk

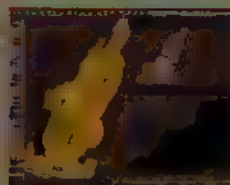


FREEZE FRAME

A yellow wheel-shaped object appears, its position in black space marked out by its reflection on an unseen surface. Moving quickly, it speeds toward the camera, the view cutting as it moves away. Yellow trails behind the ball get stronger and more solid as the ball accelerates, creating a mass of criss-crosses and loops. The view settles to show the yellow ball in greater detail. Other elements then become visible and together they constitute a vacuum cleaner with a unique pivoting system. As the camera tracks the cleaner, we see the Dyson logo and get a glimpse of just how effortlessly it can be manoeuvred. Finally, we get the product name and logo. "The Ball - Dyson - designed to move."

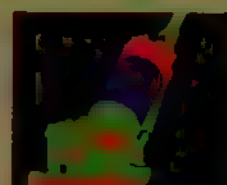


Vacuum visions: how The Mill created a unique ad for a unique product



01 "Although we were supplied with CAD data, we still had to spend four weeks cleaning up the model to prepare the geometry for ray casting," says 3D Producer Satoko Iinuma. "We went from 11.8 million polys to around 20,000."

02 "The first frame would animate the ball or any other element, get the composition right, and then hand out the next frame to be added," says 3D Animator Laurent Makowski. "I had to redo the trails each time an animation changed."



03 "It was more efficient to render several separate diffuse, specular or ambient passes and so on," says Makowski. "It enabled easy fine-tuning within frame, without the need to go and re-render very heavy scenes."



04 Work on the XSI script to control the trails went on throughout the ad's development. "It's designed to be very simple to control, with variables for speed, amplitude, wavelength, scaling, thickness and twisting," says Laurent Makowski.

05 The 3D modelers used simple lit surfaces to represent the cleaner components. "It's very difficult to get plastic looking real with CG," says Makowski, "but the vacuum had to look seductive, so we couldn't add any dirt."



06 "With just the ball visible, rendering was still quite fast," says Makowski, "but the rest of the vacuum cleaner is packed with polys. For the final shot, where the ball joins the other parts, we were leaving the renders running all night."





MeNTaL RoY

Hallucinating after a few too many sleepless nightshifts spent frantically animating a child-friendly 3D Spelling Dinosaur toy called Thesaurus Rex, resident columnist **Mental Roy** wonders what on earth is up with the Doc...



WHY IS THE BBC destroying our childhood memories? "Because they want to, because they want to..." That seems to be the rationale behind the dubious decision to reincarnate that oft-abused franchise, Doctor Who, and have it rematerialise awkwardly in the 21st Century.

Here are the rules. Doctor Who himself is a classic science-fiction archetype - the peculiar outcast, the alien masquerading unconvincingly as a human - who, as he roams space and time, has developed eccentricities and idiosyncrasies that may not help him fit in, but they certainly help him save the day, in a spaced out, charming sort of way.

He usually dresses like he's covered himself in superglue and rolled around in the dressing-up box of a playgroup in a particularly pretentious neighbourhood. Therefore, he should NOT - repeat NOT - look like a fresh divorcee nudged out onto the dancefloor at a Tragic Singles night. He should NOT be wearing the same leather-jacket-and-jeans combo barely camouflaging the overpowering mid-life crises gripping dads everywhere.

Contemplating the rest of the series, you wonder whether this cry-for-help brand of 'dad-cool' has spread to any more of the cast from the past. Will arch-villain The Master make a return, wearing a pair of baggy three-quarter length combats and a North Face jacket? Will the Cyberman be discovered plodding slowly towards the camera in Binkstock Flip Raps? And when the Doctor once again comes face-to-face with Davros, will he be flicking anxiously through a copy of Men's Health?

Even ignoring the stilted dialogue, mockney acting and hilariously lame jokes - surely our asexual Galfridian Doctor shouldn't be trying to pull Billie

Piper! If you're out to save the universe, IT'S A FACT that all you need is a cheaply constructed talking metal dog at your side.

Designed-by-committee-madness Exhibit Two surely has to be Warner Bros' new futuristic reimagining of the Looney Tunes gang for their "hip" new audiences. That's right, the company has seen fit to take one of the most universally adored cartoon characters ever committed to the cel, redesign him for a spate of futuristic adventures, and call him Buzz Bunny, which, as any strictly filtered Google SafeSearch will inform you, is the same name as a CLITORAL STIMULATOR. Makes you wonder at what point we'll be seeing that cinematic catchphrase: "That's all, folks..."

So what does 3D and visual effects have to do with all this? Well, that's just it: we're the ones *performing* this pig. But why are these kinds of decisions being made? Well, clearly the BBC is already counting the millions it's predicting will roll in at Christmas from remote-control daleks, Sonic Screwdrivers, action figures and books; and with its "effective suction cups", Buzz Bunny's status as a popular toy is pretty much assured, too.

Yet one good thing about our work is there's still some degree of separation from the demands of commerce. If we do our job properly, people will still remember how scary the CG effects were, long after the talking daleks are being carted off to the car boot sale. So from now on, make it your mantra. If you're being told to create a Swirly Talking 3D Intelligence That <ahem> Controls All The Plastic In The World, make it an *outstanding* Swirly Talking 3D Intelligence. And even if it's a Wheelee Bin That Belches In An Amusing Family Entertainment Way - the same applies, goddamnit. And one day, you might end up working on something that, unlike the majority of 3D and effects work, doesn't ultimately exist to sell toys to children.

DOCTOR WHO SHOULD NOT DRESS LIKE A DIVORCEE NUGGED OUT ONTO THE SINGLES' CLUB DANCEFLOOR

ERRATUM

TURBO SQUID

In issue 6 of 3D World (May 2005), while attempting to praise 3D resources and asset marketplace Turbo Squid on reaching its landmark 100,000th 3D model for sale, we incorrectly stated that the website was created by Digimation. We'd like to emphasise there's no connection between the companies and apologise to all concerned.

[w] www.turbosquid.com



GLOBAL ILLUMINATION #01

The state of the 3D industry in other countries, reduced to numbers. This issue: India

The advent of digital animation coincided with liberalisation of the Indian economy, opening up the country's assets to animation producers and investors. It also offered the benefits of lower production costs, strong creative and technical skills, and a large population of people fluent in English. Contact with foreign companies has helped production studios in India build the domestic animation market, resulting in a spate of commercial TV shows, educational videos and even feature films (e.g. *Sinbad*, *Alibaba*, *Pardaves* etc). Studios are stretching their technology, incorporating 2D and 3D animation, computer-generated special effects, and virtual reality into their productions.

Larger studios throughout the world are increasingly relying on India's talent and resources, however, in terms of the quality of the work done. Indian companies have still not graduated into the big league because of problems such as a shortage of talent.

One of animation industry's largest computer animation production companies, Pentamedia Graphics, is based in India. The other leading animation houses in India include: Color Chips, Compudyne Infosystems, Cred Animation Studios, Jadoo Works, Tronza Animation India and UTV Toons.

There is a considerable increase in 2D and 3D animation outsourcing to India with the industry employing about 31,000 people in 2004.

The Indian animation industry is growing at about 15% with the growth driven by animation outsourcing from North America and Europe.

There are about 50 animation studios in India, located in cities such as Mumbai, Hyderabad and Bangalore.

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new generation

A close look into next-gen game design

New consoles arrive every five years or so, but this time, it's going to be different. 3D World takes a close look at the potential impact of Xbox 2 and Playstation 3 on the games market, and how they will affect your role as an artist **BY JON JORDAN**

Appropriately, considering its focus on visual quality, the computer games industry is on the cusp of witnessing something spectacular – acceleration in its rate of acceleration. Put in such dry mathematical terms, this might not sound that significant. But don't be fooled: the next generation of gaming consoles will mark a sea change, a step function, an exponential shift – in fact, almost any description of a rapid upward discontinuity you'd care to mention – in real-time graphics.

Whatever Sony's PlayStation 3 and Microsoft's Xbox 2 eventually end up being called, the consoles themselves are the distillation of five years and tens of billions of dollars of high-level research in areas as varied as stress-linestrained silicon fabrication, massively parallel programming

techniques, ultra-fast memory bus design and distributive computing. The result will be hardware that takes conventional wisdom, which claims that computers only double in processing power every 18 months, chews it up, spits it out and sends it home crying to its mum. Even using a conservative assessment of the timescales involved, the fact that both Sony and Microsoft have claimed their hardware

will be benchmarked at one Teraflop (one million floating point calculations per second) means they're ahead of the game by at least a factor of ten.

Pedants will no

doubt argue that the shift away from the standard Intel architecture to the multicore systems embodied by Sony's Cell processor (each contains one core and eight co-processors) means that the letter of the law proposed by Intel's Chairman, Gordon Moore – who theorised the number of transistors on a given area of silicon will double every 18

“High Dynamic Range rendering will change the look of games forever. Hardware will be designed from the ground up with HDR in mind.”

RICHARD HUDDY, ATI TECHNOLOGIES



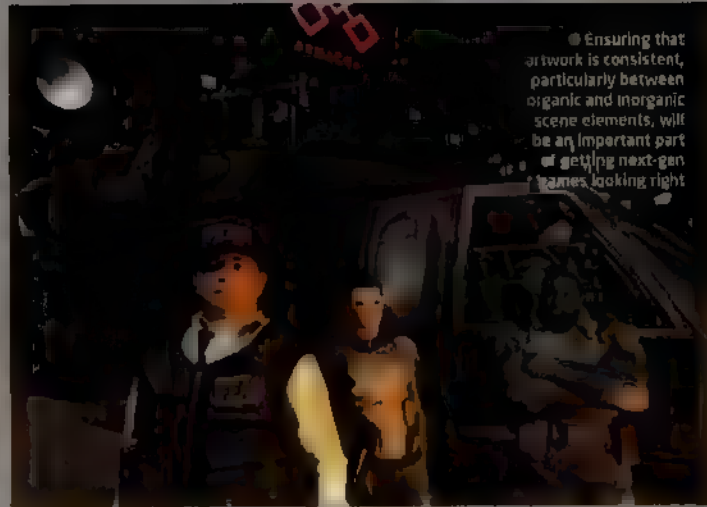
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● One of the few next-gen games to be officially revealed, Monolith's creepy shooter F.E.A.R., scheduled for an Xbox 2 release towards the end of the year



● Ensuring that artwork is consistent, particularly between organic and inorganic scene elements, will be an important part of getting next-gen games looking right

months - remains intact. Maybe so, but that only goes to prove how stuffy conventional wisdom can be. What is certain is that the new approaches in chip design undertaken by companies such as Toshiba (Sony's partner with Cell) and IBM (which is involved in Sony's, Microsoft's and Nintendo's new consoles), have massive implications for game developers.

Because, while pure calculating power or internal bandwidth won't be an issue, there are many other problems, especially concerning how to pipe datasets and art assets around architectures that, comparatively speaking, will be lacking memory. The mantra of 'Compute. Don't Store' - a banner for early PlayStation 2 game development - seems certain to make a vengeful reappearance. Michel Kripalani, Autodesk's Games Industry Manager, agrees.

"This generation of systems will be highly RAM-limited, so alternative methods for storing geometry, such as procedural

Avid's European Business Manager for SoftImage, Patrick Greene, is under no illusion about the impact on artists. "It's going to be huge shift," he says. "Our customers tell us they're looking at a tenfold-plus increase in terms of art quantity and sophistication. Clearly, few developers have the luxury of simply growing their art teams by ten times and, even for those that do, the sheer numbers bring along whole new scale and production challenges. It means we, as tool vendors, have to find new ways for artists to work, particularly in terms of re-using and refining assets rather than building from scratch."

QUICK FIRE

Yet there's surprisingly little time for experimentation. Although there were still no announcements as *3D World* went to press, it's almost a certainty that Microsoft will launch Xbox 2 in time for the US Christmas 2005 market. In comparison, Sony isn't expected to get PlayStation 3 out of the blocks in significant numbers until the summer of 2006, and hasn't even started full scale production of Cell yet, let alone shipped anything like finalised development kits. For the record, Nintendo's Revolution console, which won't be as technically advanced as its competition (and hence will be ignored for the remainder of this feature), will slip out sometime in between.

However, the good news is that the picture is much clearer when it comes to understanding how the consoles graphics hardware works. In fact, it would be fair to say that it's as conventional as the console CPUs are weird. Microsoft is partnering up with ATI Technologies and Nvidia with Sony, with both parties expected to rely on close-to-standard high-end PC graphic technology.

In many ways, this marks the triumph of Microsoft's DirectX game-rendering Application Programming Interface (API). First released in 1995 to provide a standardised environment between graphic cards vendors and developers, it has become the *de facto* environment for Windows graphics. The rival cross-platform OpenGL, which flagged in recent years, has also received a boost with

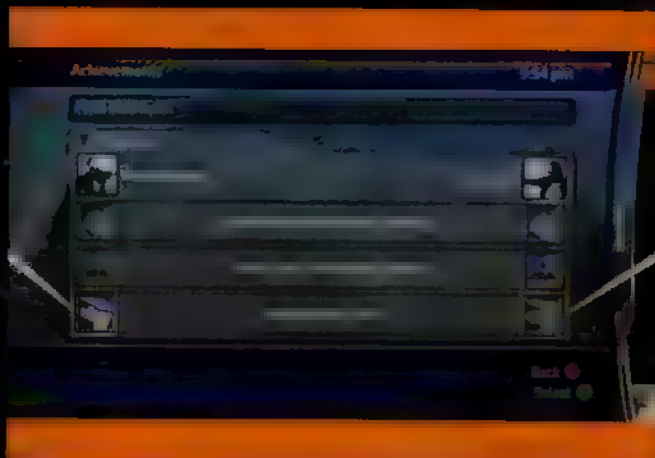
"Our customers tell us they're looking at a tenfold-plus increase in terms of art quantity and sophistication. It means we, as tool vendors, have to find new ways for artists to work."

elements, will have to be found," he says. Yet the scale of the technical challenges ahead suggests obvious solutions are unlikely to work: "I'm not convinced we'll see people using NURBS," he says. "In fact, I can almost guarantee it: they're simply too slow for a run-time environment. We might see use of subdivision surfaces for solving level-of-detail problems, but remember, the PlayStation 2 chipset was highly optimised for higher-order surfaces, and developers never gravitated towards them. We might not see a shift this time either."

And it's this kind of technical uncertainty - hardware likes curved surfaces, but coders and artists don't - that's starting to worry developers. If PlayStation 3 and Xbox 2 turn the fundamentals of silicon design on its head, what are they going to do to the process of making games?

FUTURE SHOCK | How will next-gen consoles change the industry?

When venturing into a new territory, it's tempting to assume that either everything or nothing will change. In the transition from PlayStation to PlayStation 2, there was little radical difference in terms of how the games market worked: people still bought games for roughly the same amount of cash. Only the type of games varied, as additional processing power meant that 'open-ended 3D urban environment' became the marketing buzz-phrase, thanks to the success of the *GTA* series. But commercial success came as publishers kept risk levels as low as possible, focusing on sequels, games based on real-world sports licenses (such as *NFL* and *FIFA*), and other media tie-ins, such as *Harry Potter*, *The Simpsons* and *The Lord of the Rings*. Hence, with the exception of *The Sims*, the majority of bestsellers remained in core genres, such as shooting and racing.



● A key aspect of the struggle for supremacy in the next-generation console war will be the provision of online services and downloadable content. The new consoles are expected to be well equipped in this area: here's a sneak peek at Xbox 2 Live's interface

In a next-gen games environment where development teams may double in size (and budgets rise even faster), it would be foolish to assume this is going to change.

Another reason for this is the manufacturing complexity of the consoles themselves. Demand for

new consoles is always highest at launch - precisely when production lines are at their least efficient. This will be a problem for the multiple-chip Xbox 2 and PlayStation 3 as silicon manufacturing is prone to such inefficiencies, which have the potential to cause bottlenecks when building up commercially viable install bases. So not only will publishers be dealing with higher production costs, the market for their shiny new games will be relatively small. One answer will be to charge more for games: anything up to £50 has been proposed.

Another thing likely to change is the role of the internet. Even with its out-of-the-box broadband/hard-drive combo, Xbox only enticed 10 per cent of gamers online but, with five more years of broadband penetration and consoles designed for online services, this will be a real test of the public's reaction to the connected living room. In terms of games, the key issue will be downloadable content. Retail won't disappear of course; \$20 billion in global annual sales doesn't fit even the fastest, most secure broadband pipe. But it's not impossible that the sale of additional content, such as new episodes, levels, characters and skins could hit \$1 billion, especially if Microsoft's plan for micro payments come to fruition.

It might not look like much, but the Cell processor from Sony, Toshiba and IBM promises to revolutionise consumer electronics graphics, starting with PlayStation 3 but also including digital TVs and high-end workstations.

WINNERS

1 SPORT TIE-INS

With EA tying up exclusive deals with FIFA, NFL and ESPN, don't expect anything new

2 DOWNLOADABLE CONTENT MODELS

The top five per cent of games will make serious cash via micro payment downloads, but minority titles won't

3 REPUTATION SERVICES

The immediacy of IM and reputation system of eBay will meet friendster, blogger and flickr - call it gamestr...

4 REALISM

High Dynamic Range rendering and the flexibility of shaders combine with high detail models and pervasive physics - wow!

5 MESSY MEDIA CONVERGENCE

Watch 24 or CSI and then play the game of that episode. Just don't expect the same with *Euterriders*.

1 GAMES-AS-ART MOVIE

This is a distribution and production model for console blockbusters, not arthouse. Stay with the PC

2 IN-GAME ADVERTISING

Lots of people will try to crack the 18-35 demographic, but gamers just don't care

3 MOVIE/GAME CO-PRODUCTIONS

Expect plenty of ambitious announcements (James Cameron already) but few interesting outcomes

4 HARDCORE GAMERS

On your own, you're not a commercially viable market any more. It's time to grow up, or say goodbye

5 LOW LEVEL

There are too many co-processors and not enough time. It's called middleware - use it!

LOSERS

the announcement that Sony and Nvidia will be using a customised version of it for PlayStation 3 development. But specifics apart, what's important is that both APIs have focused on increasing the amount of flexibility for developers to decide how they set up rendering tasks on the available hardware. This is characterised by most recent releases, DirectX 9.0c, and OpenGL 2.0, which enable you to fine tune your scene down to the levels of per vertex, generally used for animation, and the per-pixel, used for visual effects. "The future is in programmable shaders," says Richard Huddy, ATI Technologies' European Developer Relations Manager. "The main differentiator between games will be the clever and subtle use of shaders - that's where the most valuable intellectual property will be found."

On the PC, the result has been an explosion in the richness of graphics, as seen in games such as *Half Life 2* and *For Cry*. The dust has been blown off old SIGGRAPH papers ranging from surface effects such as Normal and Displacement mapping to real-time lighting approximations like Spherical Harmonics and Light Bleed mapping - and even offline processes such as precomputed Radiance Transfer functions and irradiance volumes and gradients.

However, Huddy contends that the most impressive visual leap in next-generation console games will be the widescale adoption of High Dynamic Range (HDR) rendering.

"I'm not convinced we'll see people using NURBS in next-gen titles. In fact, I can almost guarantee it: they're simply too slow for a run-time environment"

MR. HEDDLEDALE, JAMES AND JESSIE MANNING & ASSOCIATES

"It's going to change the look of games forever," he says. "To get the characteristic strong contrast in colour ranges and brightness and, at the same time, retain subtlety in shades and hues in the darker areas of the image, you need hardware that can support rendering operations such as blending, fogging and anti-aliasing. Current implementations have major restrictions that limit their appeal, but future hardware [will be] designed from the ground up with HDR in mind. Then we're into a bright new world."

OLD DOGS AND NEW TRICKS

Of course, as new techniques become possible, there will be an impact on artists' workflows. Although you don't need to re-author everything - it's possible to convert crucial assets piecemeal - developers will have to shift their art and code pipelines to using floating-point data. Huddy concedes that getting this power into the hands of artists will be a challenge for tools vendors: "Right now, support for HDR is patchy," he says. "The tools guys need to get moving."

But where there's change, there's also opportunity. The past couple of years have spawned a range of new tools, from larger, general-specific workflow processors like Autodesk's Pixologic's real-time sculpting package *ZBrush*. "As Normal mapping has become a standard technique, Pixologic has been able to jump into established markets," says Huddy.

Real-time reflections, as seen on the glass of the helmet, can be generated at relatively low computational cost using dynamic Cube maps, which use a low-resolution environmental mesh.



A big push for real-time graphics companies is something called subsurface scattering, radiance terms to approximate subsurface scattering, especially around nostrils and ears. Combined with the standard model of direct illumination, the results are subtle but noticeable.



SpeedTree is one tool being positioned for next-gen. Its real-time engine has been integrated with the Unreal Engine 3, and uses its own, direct lighting and Normal mapping to boost the visual quality of its foliage.

FUTURESHOCK | Beneath the hood of a next-gen game: inside Epic's Unreal Engine 3

01 Epic's Unreal engine uses a variety of dynamic shadowing effects.

Stencil buffered shadow volumes provide the basic functionality, ensuring dynamic lights cast accurate shadows on objects in a scene. Soft self-shadowing (as in this example) is created by using the brute force of 16x-oversampled shadow buffers.

02 Epic uses advanced lighting models, offering parameterised Phong lighting, virtual Displacement mapping, pre-computed Shadow masks and pre-computed bump-granularity self-shadowing using spherical Harmonic maps.

03 All next-gen games will use HDR lighting. In this case, Epic's Unreal engine uses a 64-bit HDR rendering pipeline to provide gamma-correct, linear colour space imagery. It also enables a wide range of post processing effects such as light blooms, lenticular haloes, and depth-of-field.



04 The skeletal animation system supports up to four Bone influences per Mesh vertex with animation driven by a tree of objects. This can be tied into the physics engine for Ragdoll dynamics, or controlled via C++ or UnrealScript.

05 Unreal's supported shadow techniques are visually compatible and can be combined with coloured attenuation functions enabling properly shadowed directional, spotlight, and projector lighting effects.

06 This model consists of 5,300 polygons but it has surface detail from the Normal map of a two-million polygon version. This is calculated with distributed-computing application, which raytraces the mesh into a 2048x2048 texture.



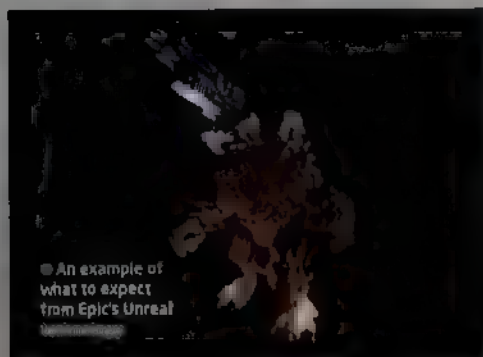
While the eye candy provided by new per-pixel rendering techniques will monopolise the headlines of next-gen games development, some commentators predict that the adoption of physics-enabling procedural animation will actually be one of the most significant advances.

One such pundit is James Golding, a programmer for the Unreal engine at Epic Games, who used to work for UK physics specialist MathEngine. "The most exciting thing at the Game Developers Conference was seeing

people experimenting with procedural animation," he enthuses. "It's more than just the physics of the body - it's taking a higher level view of the character, where you want to 'direct' your scene instead of meticulously controlling the movement of every bone."

UK tools company NaturalMotion is using a similar approach: its *endorphin* package synthesises motion at runtime by blending together libraries of set actions, which frees up animators from the laborious task of keyframing or cleaning up motion-capture data.

"There are plenty of approaches," says Golding. "Some people are working on parameterising walk cycles so you can easily vary the mood or posture. Others are looking at using animation to drive 'muscles' in Ragdolls. Having characters interact believably with a varied environment is difficult with traditional blending; I think this is going to be an active area in the coming years. Our crates now move as well as they look - so it's time we started doing the same for our creatures."



● An example of what to expect from Epic's Unreal



● Monolith's F.E.A.R. employs the full range of pixel shader effects, mapping techniques and dynamic lighting to create an appropriately oppressive atmosphere

"Clearly it's much more than just a Normal mapper, but I've been impressed at how quickly it's created a market for itself, often on the back of this one feature"

Another company seizing the day is RTZen. Consisting predominantly of ex-Autodesk staff, its *RT/shaderGlnza* product provides a real-time shader development environment, specifically designed for next-gen work. "[Workflow] has been a bit ridiculous on the current generation of consoles," says RTZen's CEO, Jeremy Hubbell. "Programmers have had to write shaders based on direction from the artist. Think about where we'd be if every time an artist wanted to build a character, they had to consult a programmer to write the code that built the geometry." The aim with *RT/shaderGlnza*, which has been used in the development of future titles, is putting the power back into the hands of artists. "As projects get bigger, artists will spend more time building content, and programmers will focus on integrating that content into the title - that's the way it should have been all along," says Hubbell.

"As the projects get bigger, artists will spend more time building content, and programmers will focus on integrating that content into the title - that's the way it should have been all along."

— J. HUBBELL, RTZEN

While the niche players find themselves in the limelight, the established digital content creation vendors such as Autodesk, Alias and Avid have to deal with a different set of issues: managing an asset pipeline that's expanding in depth and scope. In a sense, this is what they always wanted - to be locked into the production core of a commercially vibrant games market. What they are finding, however, is a divergent set of problems ranging from having to provide an increasingly high level of plug-in support for new products such as *RT/shaderGlnza*, to ensuring their pipelines are robust enough to handle the amount of data being forced through them.

Avid, in particular, has taken a strategic view, buying the art asset management specialist NXN and integrating

its *Allenbrain* product with the *Softimage|XSI* line: "The trick is going to be getting the content from the art tool - and there's lots of it - into the engine reliably and quickly," says Greene. "The focus will move from tweaking shaders and refining effects to getting this bulk of material created and through the pipeline as quick as possible. In terms of tools, production and asset management systems are now critical, as opposed to the latest new piece of maths or rendering trickery"

CALL MONOLITH

Autodesk took a tactical decision with *3ds max 7*, focusing on productivity and stability issues. "What we're talking about is workflow. In order to solve these issues, we've focused on artist work-speed first and foremost. We took huge strides to improve our workflow speed in *3ds max 7* and we're not about to stop there," says Kripalani. Alias is in the same position. "The fact that our top three *Maya Complete* customers are games companies makes a difference in terms of the amount of attention games got during *Maya 6*'s development," says Geoff Foulds, Alias Industry Marketing Manager for Games and Interactive. "We've ensured *Maya* offers scalability at a low level, as well as extensibility within its higher level tools." There has also been a push to ensure *Maya* can be more easily integrated within existing art pipelines. Through extensions to its Application Programming Interface and MEL scripting language, third-party tools developers have more access to *Maya*'s low-level features. The acquisition of Kaydara, with its FBX interchange file format and *MotionBuilder* character animation package, also adds significant features to the *Maya* pipeline.

There's no doubt the efficiencies provided by tools and middleware will play a vital role in next-gen development, but the biggest unknown is the issue of manpower: "We can conservatively expect team sizes to double from the last generation," says Kripalani. What's certain is that there's going to be more of everything - more processing power, more assets, more use of middleware - and, especially, more artists per project. The trick for success, both at a company and a personal level, will be concentrating on elements that distinguish you from the opposition. As for the gamers themselves, they'll be far too busy playing to notice. ●

FUTURESHOCK | How will next-gen consoles change your job role?

You don't need to be a prophet to foresee the impact that next-gen consoles will have on the role of the artist. For one thing, each team will consist of a lot more of them, so expect a need for more specialised artists. The flexibility provided by vertex and - especially - pixel shaders, will also have the effect of making the role of shader artists more technical. Hopefully, tools provided by the likes of Nvidia, ATI Technologies and the DDC vendors, as well as third parties such as RTZen, will ease the transition.

"I think there'll always be artists who want to be artists, not mathematicians or scripting whizzes," says RTZen CEO Jeremy Hubbell. "You can make a tool that appeals to both types of artists without alienating one from the other. From the standpoint of job security, it can't hinder you to learn some of the technical aspects of the tools you're using but, in the end, you're creating art: no matter what anyone says, knowing how to use an art tool doesn't make you an artist."

ATI Technologies' Richard Huddy agrees that this balance of art and technical ability will be particularly highly valued: "Not enough software houses have enough well-trained technical artists," he says. "By this I mean those artists who not only



● Five shots from a demo of UK studio Ninja Theory's next-gen title. A combination of high-detail maps, complex facial rigs and per-pixel lighting is required to bring characters like this to life, creating demand for artists with the skills necessary to produce them



understand the artistic vision for a game, but also have a feel for how current graphics cards make that vision possible."

At the opposite end of the artistic spectrum, there will be openings for fine artists who focus on creating detailed textures. Other roles set to blossom include dedicated concept artists, cinematographers, high-res modellers (great for Normal maps and can be generated either by curved surface or 3D-scanned physical clay models), facial animation specialists and technical directors. But perhaps the crucial skill underpinning all these will be communication. With teams of 50+

being more or less the norm in game development, making sure everyone knows what they're doing (and are working to consistent templates and style guides) will be paramount.

What's less easy to predict is the role of outsourcing, especially to low-cost countries such as India and China. The temptation, especially in the early days of next-gen, will be to think their involvement will be limited to the building of non-core assets such as marketing materials, renders and cinematics. With such a technical learning curve, developers might want to keep all critical areas in-house. This interpretation does depend on the aggressiveness with which outsourcing companies decide to get up to speed with next-gen development. Major publishers such as Ubisoft and EA are shifting internal development; both have plans to establish studios of 1,000-plus staff in China in the near future.

There may also be a role for small groups of experienced specialists who can be bought in to build asset pipelines before production starts, or troubleshoot problems during the production process. But whether game development in general can sustain a movie-style production model, bringing together disparate groups on a per-project basis, remains open for discussion.

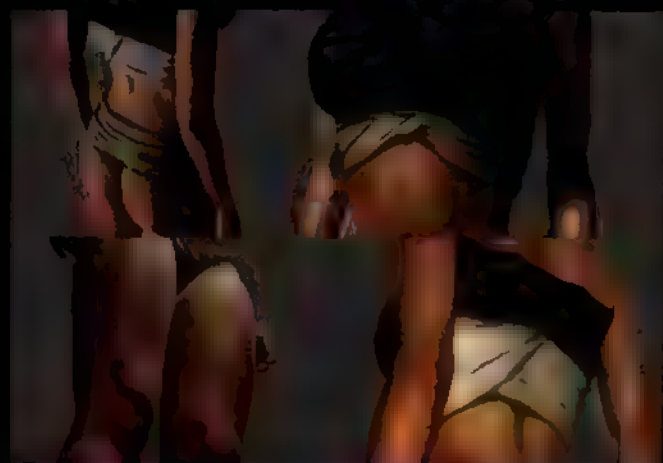
WINNERS

- 1 SCRIPTERS**
Whether via MEL, MAXscript or custom engine code, the ability to extend tool functionality will be an increasingly vital skill.
- 2 CINEMATOGRAPHERS**
Cutscenes will become more integral with gameplay, requiring input from artists with movie-related skills.
- 3 FACIAL RIGGERS**
Making game characters speak and emotive even in a vaguely realistic manner remains a Holy Grail.
- 4 TECHNICAL DIRECTORS**
Taking over the lead artist's role, these will aid in terms of communications as much as art production.
- 5 SHADER ENGINEERS**
With reusability a byword for shaders, artists who can build unique materials will be in high demand.

LOSERS

- 1 JACKS-OF-ALL-TRADES**
It's always good to be flexible but your future employment will rely on being indispensable.
- 2 LOW-POLY MODELLERS**
There will always be restrictions for games, but the days of the sub-1,000 poly model are over.
- 3 SPRITE ARTISTS**
Valuable in the world of 2D graphics, 2005/6 will be the time to switch to mobile game development.
- 4 LEVEL ARTISTS**
On your own, you're not a commercially viable market any more. It's time to grow up, or say goodbye.
- 5 ENVIRONMENTAL ARTISTS**
With complex lighting and shadows effects handled dynamically by shaders, now would be a good time to learn Cg...

LOSERS



● Next-generation skin surface shaders in action, again seen in UK developer Ninja Theory's upcoming title. As the barriers between art and programming jobs erode, artists who can create their own unique shaders will find themselves increasingly in demand

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TUTORIALS

TECHNIQUES / TIPS / TRADE SECRETS

LIGHTWAVE • 3DS MAX

skin deep

Simulating realistic human skin is one of the most complex tasks faced by a texture artist. Over the next ten pages, we'll be showing you two ways to craft the subtle surface details that bring a 3D character to life

FACTFILE

OF THE SKIN ON 1
(PAGE 44)

SOFTWARE
LightWave, Photoshop

DIFFICULTY
Intermediate

TIME TAKEN
3 hours

PERFECT SKIN
(PAGE 50)

SOFTWARE
3ds max, Paint Shop Pro

DIFFICULTY
Advanced

TIME TAKEN
45 minutes

For many years, 3D software simply wasn't equipped with the tools to mimic the way in which skin reflects light. Although most light rays are reflected from the skin surface, others penetrate some distance through the underlying layers of cells, before re-emerging: a phenomenon known as subsurface scattering. The result is a subtle, soft, slightly translucent look.

However, early shading technology was much better at simulating hard, evenly reflective materials, in which all of the light is returned from the surface of an object. As a consequence, where human figures did appear in 3D imagery, they tended to be stylised and unrealistic – think of the children in the *Toy Story* movies, for example.

SKINNY DIPPING

Today, however, while texturing human skin still remains a complex and intricate process, technology has advanced to the point at which the necessary tools are available to many in most modern 3D software packages. Over the next ten pages, we're going to be looking at two very different approaches to using those tools.

In our first tutorial, Leigh van der Byl of leading US visual effects studio CafeFX explains how to set up materials that mimic the properties of real human skin, before going on to discuss how to paint detailed texture maps in *Photoshop*. The walkthrough focuses particularly on the imperfections that give real human skin its character – pores, broken veins, warts and all.

In contrast, the talented young French artist Olivier Ponsommet takes a more painterly approach to the subject – and more conventionally beautiful subject matter. In his masterclass, which starts on page 50, he explains some of the technical and artistic tricks used to create the still image on the right, including the post production techniques used to create the subtle surface detail on the woman's face. And if you're working on a tight budget, don't lose heart: for most of his texture work, Olivier uses nothing more expensive than a copy of *Paint Shop Pro*.



Discover some of the 3ds max and
Paint Shop Pro techniques used by
French student Olivier Pansonnnet to
create this image in his skin
texturing masterclass on page 50

LIGHTWAVE • PHOTOSHOP

Gimme some skin

Recreate the fine details of human skin - pores, imperfections, blemishes and all - with our comprehensive guide to painting convincing texture maps

BY LEIGH VAN DER BYL

FACTFILE

FOR

Lightwave and
Photoshop

DIFFICULTY

Intermediate

TIME TAKEN

1x, 2x or 3 hours

ON THE CD

- Full-sized screenshots
- All example textures and
texture maps created
with the maps created
- Initial and final texture
files in PSD format

ALSO REQUIRED

Lots of reference photos
of faces



The photorealistic human is a kind of Holy Grail for 3D artists, a goal to be desperately pursued in the quest for the ultimate render. Over the last few years, shading technology has advanced to the point that renderers can accurately simulate the properties of organic surfaces, such as subsurface scattering and advanced diffuse shading. But while shading is the part of the image creation process that actually generates the lifelike, fleshy quality of the skin, texture maps are still necessary to provide colour variations and idiosyncratic details that give your character a realistic looking skin surface and a believable personality.

Essentially, the entire surfacing workflow can be divided into these two component parts: the shading and the textures. Shading defines how a surface reacts to light, a process that involves finding the right balance of diffusion, reflectivity (specularity), translucency and so on. Shading your model correctly can prove to be difficult and is often the failing point of a—otherwise well-constructed surface. Luckily, these days more renderers are starting to ship with native shaders that are designed to be used for organic surfaces. But while shading defines the overall quality of the surface, textures add details that cannot be created by shading alone.

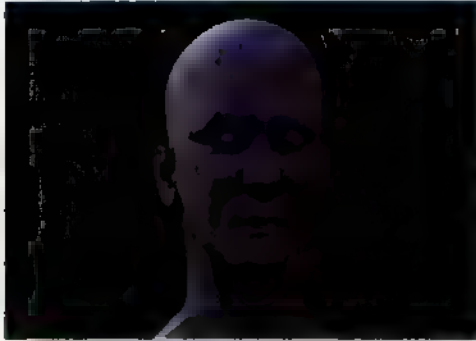
In this tutorial, we'll be focusing primarily on the techniques needed to simulate the realistic, rather weatherbeaten skin of the character above. While the bulk of the walkthrough will focus on creating the texture maps, it's generally good practice, especially for organic surfaces, to set up the shading, together with the lighting, before you begin painting any textures. This helps you focus specifically on the basic qualities of the surface itself, without being distracted by any detailed textures. Once the shading looks correct, your textures should be created in such a way as to add details, without changing the overall shading that you've created. This tutorial will guide you through these steps.

The renders for this guide have been created with *Lightwave*, but I've avoided using any third-party plug-ins in order to make the tutorial easily accessible, whatever software you use. The texture painting is demonstrated using *Photoshop*. However, both the 3D and 2D concepts and steps demonstrated here can be reproduced in any similar software packages.

Leigh van der Byl is a South African-born 3D artist who lives in California and works for US visual effects studio CafeFX. Her recent credits include *Sin City* and *The Aviator*.
[w] <http://leigh.cgcommunity.com>



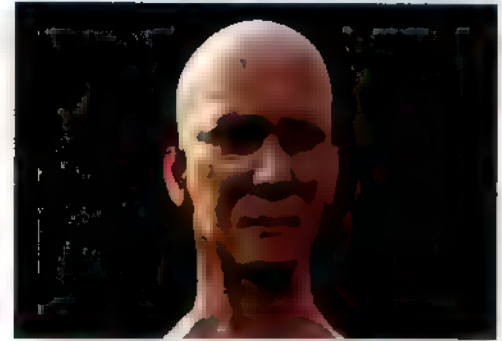
STAGE ONE | Shading and lighting



01 A good render starts with a good lighting setup. As we have limited space, we can't use too many lighting details. However, beginning with a main keylight above the model and one or two fill lights to fill the shadows provides us with a good starting point. Putting a tiny bit of colour into your lights can help with the shading.

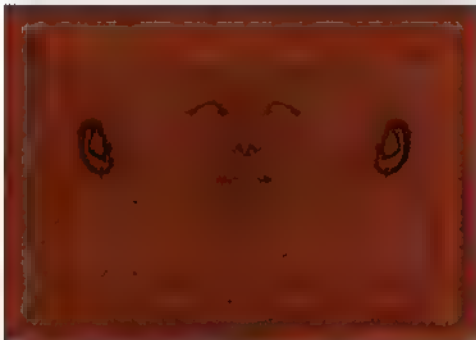


02 Start by assigning an overall fleshy colour like 232, 188, 161 to your model. If necessary, tweak your lighting to create a suitable fleshy tone. Play with your translucency, diffuse and specular settings to create a basic fleshiness for the surface. Don't rush this step - spend time on it to make sure you get a decent-looking skin material.



03 Skin gets a lot of its details from its reflectivity, so assign a low level of reflectivity to the material - say 5% overall. I prefer to avoid the use of too much specular as it tends to make things look like plastic. When combined with a proper environment (image or poly-based), low levels of reflectivity tend to yield more realistic results.

STAGE TWO | Creating the basic Colour map



04 Open the file skin_head.psd on this issue's CD. You'll notice that the image is fairly large. This provides you with more space to create finer details since you have more pixels to work with. Making the image too small prevents you from creating very fine details.



05 Tonal variations are essential in textures because no surface in the real world has constant colour. Use a large, low-opacity (3-8%), soft-edged brush to create very subtle colour variations using a selection of fleshy tones around the image. Don't place them too randomly - position them in distinct areas, such as the cheeks, chin, nose and so on. Create these on a new layer and build up the tones gradually.



06 Create a new layer and use a small-sized, round, soft-edged brush on a medium opacity to paint some random spots onto the skin. Flaws are essential for a believable skin because no human is perfect! Use a light shade of brown for this, and paint them delicately. Organic surfaces require subtle details, not splashes of colour. This is a common mistake made by beginners.



07 Create additional blemishes and imperfections on a new layer, this time concentrating on the cheeks and nose area. Freckles and other such details are often found in these areas, so use a small, soft-edged brush with varying shades of light browns, and be sure to change the size of the brush between spots so they aren't all the same size.



08 Sometimes it helps to add some greyish-blue discolouration beneath the stubble area to enhance the hair effect. Paint deep blue tones on a very low opacity (2-4%) with a large, soft-edged brush in these areas. Create these tones on a new layer so you can adjust the overall opacity to get the right level. We'll create the actual hairs a little later on.

Natural looks

Creating imperfections in skin takes practice. Many beginners make the mistake of creating details that are either too random or too precise. You need a happy medium to create imperfections that look natural. The best way to get a feel for this is to study photos of faces so you can get a good idea of the sort of flaws found in skin. You should then be able to start placing them on your canvas in a more natural fashion.

When creating organic textures it's essential to use soft-edged brushes on low to medium opacity to paint these details.

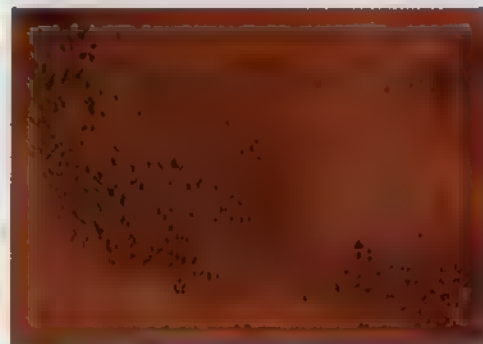
STAGETWELVE | Detailing the Colour map



09 Painting the eyebrows is simply a matter of stroking some lines in a natural-looking formation. Be sure to study some pictures of eyebrows (or even your own!) before painting these so you can create them in a natural and realistic way. The hairs tend to follow the contour of the brow somewhat, so avoid using straight lines and try to curve the hairs slightly.



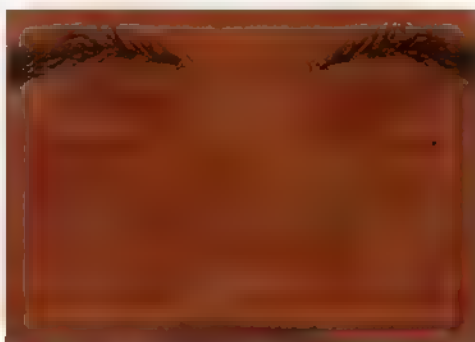
10 Let's add some stubble. This is best created with a one-pixel brush. Use black or a dark brown and paint some hairs around the chin, upper lip and cheeks. I've created a somewhat sparse beard. If you choose to make yours more dense, make sure its boundaries are gradual, instead of creating a strong, defined line between the bare skin and stubble areas.



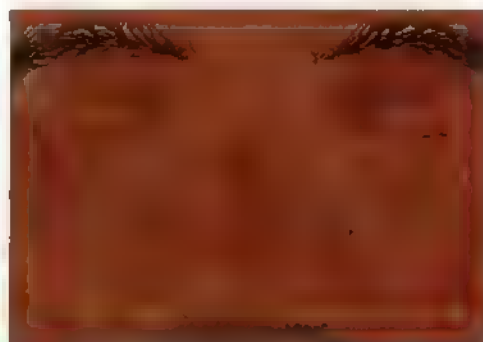
11 What's a beard without a bit of shaving rash? Add a few nice little red spots on a new layer beneath the hair layer. Use a nice rich, red tone for this, and a small, soft-edged brush on a medium opacity. Don't overdo it though - just add a couple. Add additional detail by using a small dot of a lighter shade of red in the centre of each spot.



12 Lips can be one of the trickier details to paint because they often end up looking either too red or too faint. Start painting some red, fleshy tones on a new layer, using a low-opacity brush. Instead of using a single colour, make sure you use variations of reds to pinks for a more natural look. If necessary, adjust the overall opacity of the layer to get the right level.



13 The eye area is important because most people will look at this part of the face first when looking at the render. Make sure you add the pink fleshiness in the corners of the eyes, and the red and pink tones along the edges of the eyelids.



14 The nose is almost always redder than the surrounding skin. Using a low-opacity, soft-edged brush, build up some red tones on the bridge of the nose and the nostril area. Paint slightly darker red tones in the area where the nostrils crease inwards, meeting the cheek, because the skin here is usually a bit rougher and darker on most people.



15 While not always immediately noticeable, there are veins that run beneath the skin. These veins are usually most visible in the forehead area, especially in men, so use a low-opacity brush to paint some very subtle blue veins in this area. Be sure to create these on a new layer so they can be adjusted individually.



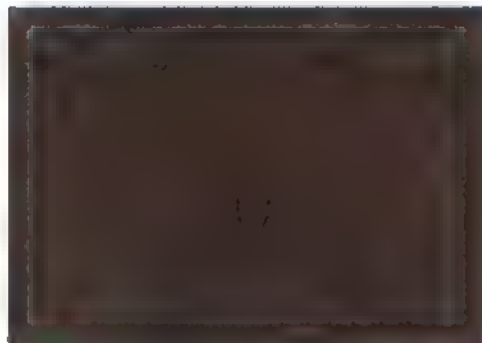
16 Because skin is very translucent, light can pass through areas like the ears when lit strongly. This is particularly noticeable when people stand in front of a strong light - their ears almost appear to glow red. While a good translucent shader can reproduce this effect, I often tend to fake it by simply painting some red tones in the ear areas. Make sure you paint on a new layer.

Subtle colours

Skin actually gets a lot of its perceived colour from a combination of reflectance and what's actually going on beneath it (due to its translucency). Add some subtle rich, deep reds and blues to the cheeks, the area beneath the eyes, and also to the ears to give the impression of subdermal activity. Use a large, soft-edged brush on a very low opacity and gradually build up these tones. As with all organic textures, it's essential to avoid creating splatters of colour. Instead, use a delicate approach to painting these tones.



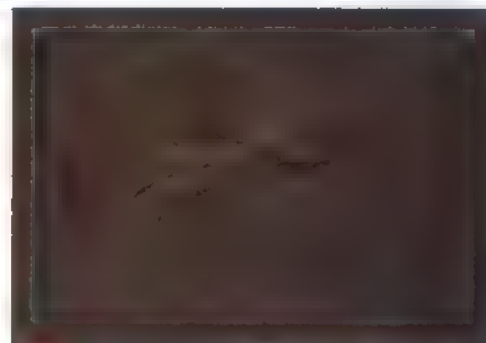
STAGE FOUR | The Bump map



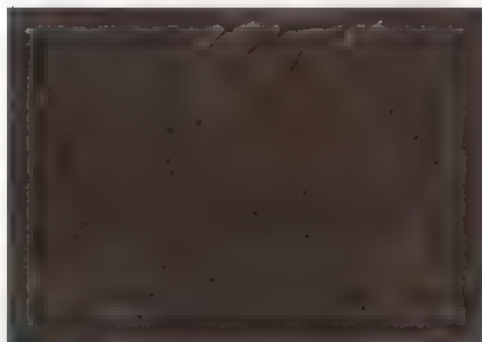
17 Create a new gray layer to form the base of the Bump map. Use a mid-shade of grey so you'll have a full range with which to create dark and light areas. Copy the original flesh-coloured layer from the PSD file and desaturate it. Now use the Overlay method to place it over this base layer. This will provide some skin grain.



18 Unfortunately, we all get wrinkles eventually. Even when we're young, we develop wrinkles around our eyes, and these become more apparent as we get older. Wrinkles are an important detail for skin and should be painted thoughtfully, and with some care. Start by creating some subtle 'crow's feet' wrinkles coming from the corners of the eyes. Do this on a new layer with a one pixel brush.



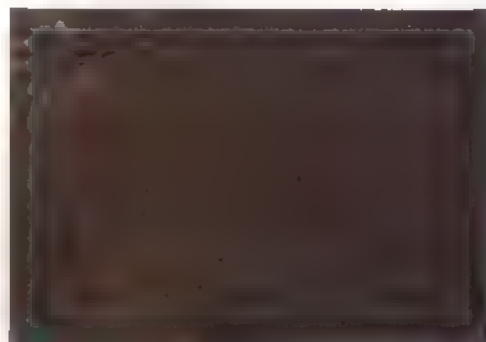
19 A common mistake with organic Bump maps is to leave them as harsh lines. Wrinkles generally need a bit of softening. Go to your base grey layer and use the Dodge and Burn tools around the wrinkle areas to create a soft, fleshy transition around them. Getting these right can take a bit of practice and requires a gradual build-up of tones, so use a low Exposure setting.



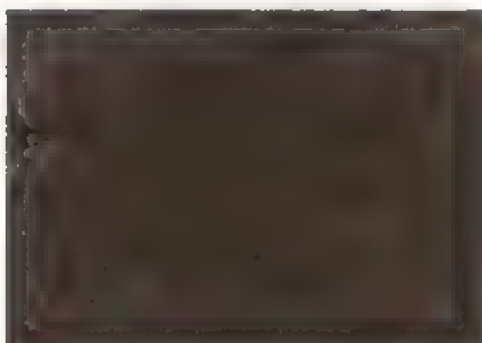
20 Men have a slight roughness to their cheeks that women don't have, so creating a little bit of texture on the cheeks is a good thing here. Leave the tops of the cheeks smooth, but add a little roughness around the beard area by painting some wide pores on a new layer. Use a soft, round brush for this.



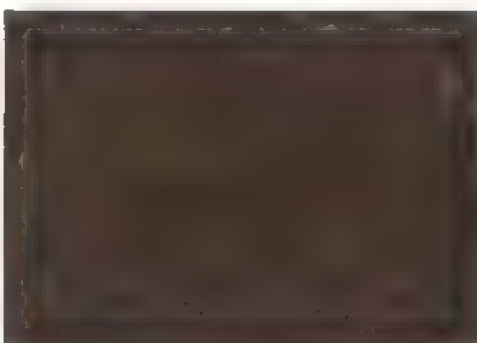
21 Look at your own nose and you'll notice that the pores in this area are usually larger than the rest of your face. Create a new layer and paint some pores into the area using an appropriately sized brush (use your own face or a photo as a reference for size). The skin also usually becomes a little rough in the crease where the nostrils meet the cheek.



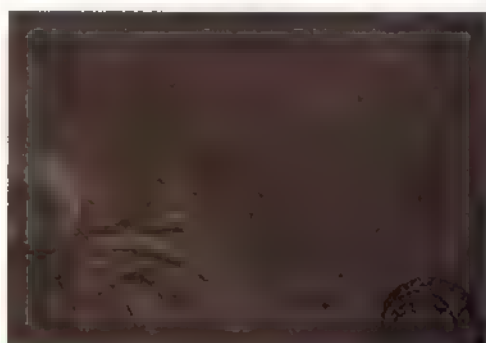
22 Remember the blemishes and spots you created earlier for your Colour map? Copy the layers you painted them on, place them above your current Bump layers and desaturate them to grey. Adjust their opacity so they'll have some effect on the Bump map too. Moles, blemishes and so on are usually slightly raised so lighten the layer if necessary.



23 Copy the layers you created earlier for the stubble and eyelashes, place them above your current Bump layers and desaturate them. Adjust their opacity levels so the hairs appear slightly raised from the surrounding skin. Be careful of making the levels too high though, especially for the eyebrows, since this will make them look unnatural.



24 The Bump details for lips can be tricky, so use a good reference when creating these. Initially, you need to create some slight overall unevenness, followed by some harsher wrinkle lines along both the upper and lower lips. Soften the areas a little around the wrinkle lines and create these details on individual layers so you can adjust their opacity independently.

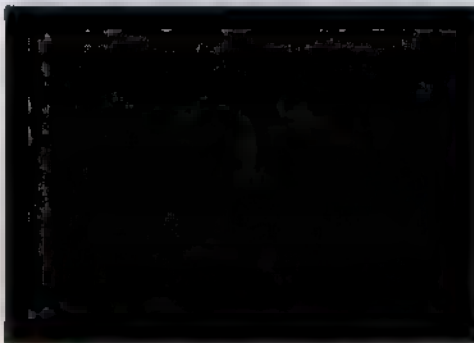


25 Copy the layer with the veins you created for your Colour map, position it above the Bump layers you've made and desaturate it to grey. Now adjust the layer's opacity to get the right level so the veins don't stick out too much from the surrounding areas. You may need to blur the layer a little to soften the edges.

STAGE FIVE | The Reflection map



26 First, let's make the nose area a little more reflective because this area is usually quite shiny on most people's faces. Use your Dodge tool on a low Exposure setting to gradually build up a lighter area on the entire nose region. Make it a little brighter on the bridge of the nose, easing off on the nostrils and tip.



27 Create some slightly higher levels in the areas directly beneath the eyes. The skin here is usually a little shinier, but don't make the levels too bright. Reflectivity is a strong effect and you don't want the skin to become mirror-like. Also, add a little more subtle light detailing in the forehead and chin areas.

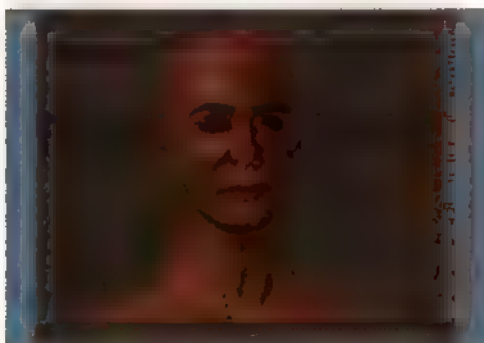
Reflection and shading

Getting the right level of reflection in your image so it corresponds with the shading you set up is simple, and the same applies to any greyscale texture image. All you have to do is start off the map with the correct corresponding shade of grey to the percentage level you assigned to that shading parameter. For example, if you assigned a value of 4% to your reflectivity, create a new grey layer in Photoshop with 4% grey. To do this, open the Colour Picker tool and choose a shade of grey. Where it says HSB, type in the percentage value in the B (Brightness) box.

STAGE SIX | Putting it all together



28 Now it's time to save out the individual images. I usually arrange all of the layers for each type of texture into Layer Groups (folders) inside Photoshop's Layers palette. This enables you to easily switch different layers on or off for working on or saving out. For really high-quality textures, save to a good-quality format like TGA; otherwise use JPEG. However, remember that you should never compress textures!



29 Now comes the moment of truth. Apply the images to the object (using the already assigned UV maps) and do some test renders. At this point, you'll often find that some minor lighting tweaks are necessary, and I generally like to add some basic Turbulence procedural textures (on a very small scale), especially to the Bump channel, for additional details and textural quality.



30 Hopefully this tutorial has helped you create an interesting, detailed and natural-looking batch of textures for this head model. Of course, feel free to experiment with the completed PSD file included on this

issue's cover disc, and remember that practice makes perfect! Painting isn't something that can be mastered overnight, so make sure you take your time and understand each step so you can really perfect your technique. ●

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TRADE SECRETS

Perfect digital skin

Master the techniques used to texture and post-produce this issue's flawless 3D cover image

by OLIVIER PARSONNET

Realistic skin is hard to fake because it's both an artistic and a technical challenge. It's artistic because you can almost feel a character's personality through the look of its skin; its wrinkles, colours and beauty spots. But it's also a technical test, because skin isn't like a homogeneous material that has simple physical properties - it's composed of several different layers. However, we always model it as a perfectly even thin surface, which is why it's so hard to get good results. To make matters worse, until recently, 3D software didn't include appropriate rendering tools to make human skin, such as subsurface scattering shaders.

To create realistic skin, you have to use some tricks. When I started the image on the right, my aim was simply to create a realistic portrait. With work and good anatomical references, I created the model in about two weeks with 3ds max. I then started to paint the texture maps with Paint Shop Pro, which isn't too hard with hi-res photos as references - but only as references, as I'll discuss later.

I then started on some rendering and lighting tests. That was the biggest difficulty: the look of the skin actually 'killed' the character and made it seem lifeless. That's why it's important to put a lot of work into the skin's appearance. I don't only mean skin shaders, but maps, lighting and post-production too.

After many difficulties trying to reproduce the different layers, aspects and colours of the human skin, I found a way to create quite realistic skin without subsurface scattering or a wax-like shader. I finally modified the rendered picture with few Photoshop filters. The following tricks may help you during your character creation process.

Olivier Parsonnet is a 23-year-old student from Bordeaux, France. His work featured in *Elemental*, Ballistic Publishing's collection of still images created in 3ds max. [w] <http://no1u.free.fr>



01 The first thing to fake is the flesh beneath the skin and its physical property to scatter light. Use a basic Blinn shader with a Shadow/Light Falloff map as an extra lighting map to make the skin a little brighter and reddish in shadowed areas. You can also mix it with a dark red and black map that's red around the ear area in order to simulate translucency.



02 Use photos as references, not as maps. Exaggerate the details: the Diffuse map is attenuated when it's mixed with other layers. Mix it with a black and white Falloff map to make the skin whiter on the surfaces that are almost perpendicular to the camera, and a white and blue marble Procedural map to simulate veins.

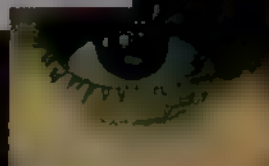


03 You can use a greyscale copy of your Diffuse map as a start for the Specular Level map. Mix it with a Perpendicular/Parallel Falloff map to make the specular reflections brighter towards perpendicular surfaces. For the specular Colour channel, use a Perpendicular/Parallel Falloff map to make the speculars more blue.

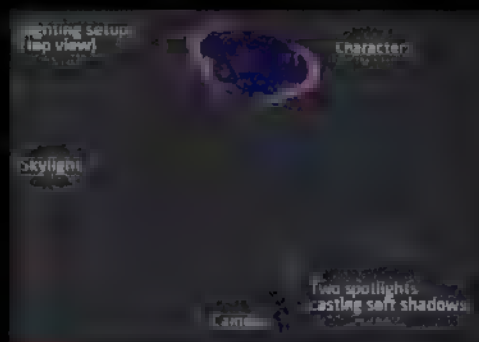


Bump map

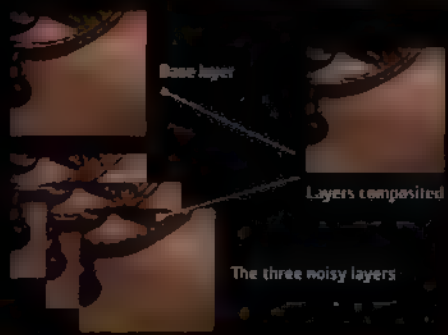
Final picture



04 The lip and eye areas need slight reflections, so paint a Reflection map in these two areas. Now use an HDRI Environment map or place two big white and self-illuminated spheres or boxes just behind the camera. Combined with a good Bump map, this gives great results. For the eye area Bump map, draw slight concentric lines around the eyes to achieve realistic blemishes.



05 The skin scatters the light and shadows never appear sharp on it, so don't use hard raytraced shadows on your skin. Instead, use Shadow maps or soft shadows with area lights. Create a really slight Dome/Skylight. This will increase the reddish aspect of the skin, giving it more depth.



06 In Photoshop, duplicate your base rendered picture three times and apply a Noise filter on each copy. Now apply a Gaussian blur with a one-pixel radius on the second copy and a three-pixel radius on the third. Set their opacities to 7%, 14% and 21% respectively. This will add little colour variations and details to your skin.



07 Still in Photoshop, duplicate your base rendered picture and apply Gaussian blur. Set the opacity for this layer to around 35% and set the Blend mode to Overlay. The skin will now look warmer, but it may still be a little too reddish so add a colour balance layer with less red in the shadows, slightly greener mid-tones and bluer highlights.



Issue 64
Understanding fundamental animation principles, and setting up a basic bounce cycle

FUTURE ISSUES

Issue 66
Building a simple control rig for the hopper for more precise control of the animation
Issue 67
Making use of the control rig from issue 66 to change the personality of the character
Subscribe today: page 40

SOFTIMAGE XSI

Get started in animation Part 2

In the second part of our beginners' series of animation tutorials, we show you how to inject a bit of personality into the movement of the hopper. And, as you'll see, it's all in the timing... **BY OLA MADSEN**

FACTFILE

FOR
Beginners

DIFFICULTY
Easy

TIME TAKEN
10 mins

ON THE CD

- Softimage XSI 5.5
- Animation files
- Scene files
- Character files

ALSO REQUIRED

The XSI Mod Tool, a free utility program that can be downloaded from www.softimage.com



Hopefully, having completed the first lesson in our 3D kindergarten last issue, you not only ended up with a nice little animation of the hopper above, but also with a greater understanding of some of the key principles of animation. This issue, we continue our four-part introductory animation course by expanding on the fundamentals learned in the first part, as well as adding new elements in our quest to produce more realistic animations.

Last issue, we set the motion of the hopper to appear as if it were controlled by gravity alone. At each bounce, the hopper's energy and momentum decreased and gravity took over, bringing it to the ground. While the same basic environmental rules still apply in this scenario, we introduce an even more influential force: character. The moment we inject the hopper with a personality, there will be a crucial change in the way we animate him. Whatever action the hopper is involved in, it will no longer be the outcome of gravity alone but rather as a result of his desire. As he isn't solely relying on his own momentum any more, but chooses to keep on

hopping, he'll keep on reaching roughly the same altitude as he did on the bounce before. Consequently, he could go on forever, at least until he got bored... or tired.

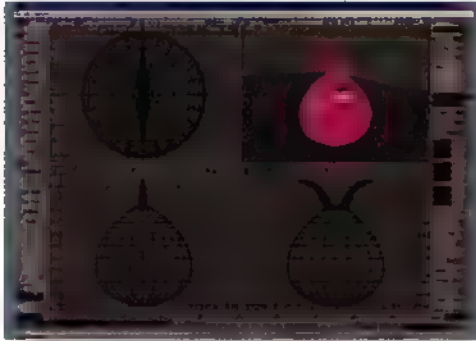
This issue we expand on the significance of properly timing by setting up a basic motion cycle for the hopper and then modifying it to add a sense of weight and personality. In addition, we'll make use of a deformer to slightly vary the shape of the hopper over time, both simulating the influence of gravity and adding to his character.

You'll find all the files needed to complete this session on your CD. The walkthrough uses *Softimage XSI*, but if you don't have a copy, a free educational version, the *XSI Mod Tool*, can be downloaded from www.softimage.com/products/Mod, while the first part of the tutorial can be downloaded from our newly redesigned website, www.3dworldmag.com.

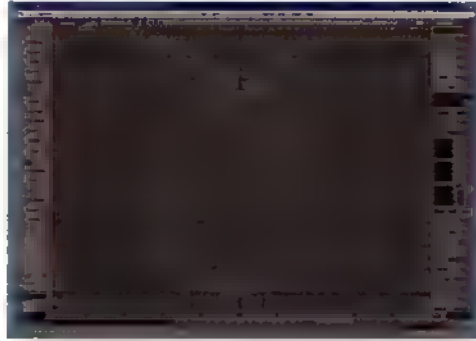
When not bouncing around the Swedish studio on his hopper, giving his enemies chinese burns or playing kiss chase, Ola animates everything from medical treatments to teddy bears [w] www.digitalcontext.se



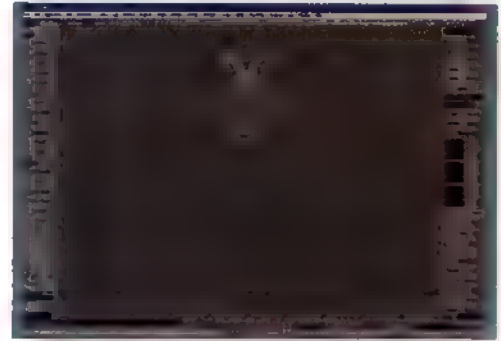
STAGE ONE | Set the high-point and contact positions



01 Let's begin with making the hopper come down and bounce up again. However, this time we'll keep him bouncing on the same spot. Open the file `hopper.scn` (the same file as in Part One) from the CD. Select the hopper and move him about 25 units upwards. Click the keyframe icon (hotkey [K]) to set a keyframe for the first high-point.

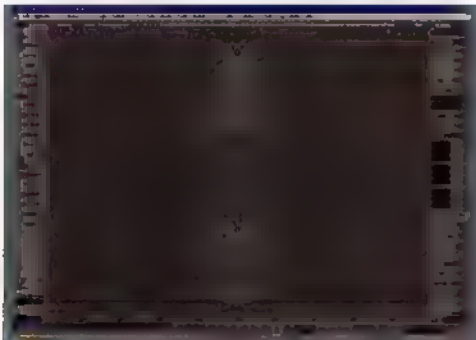


02 The hopper should hit the ground roughly half a second later. Go to frame 14 and move the hopper back down until he stands on the ground plane. Press [K] again to set the keyframe for the hopper's contact position. Please note that the timing throughout the series is based on the playback rate of 25 frames per second (PAL, which is the European standard).

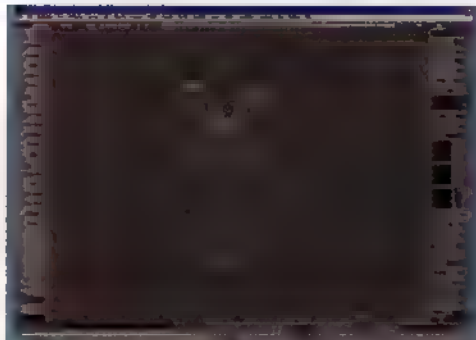


03 At frame 27, move the hopper back to the exact same altitude as on frame 1 and set a keyframe. Click the Loop button, located in the Playback panel at the bottom of the interface, and drag the yellow marker on the right to frame 27. Now when you hit the play button, the animation continuously plays the selected range.

STAGE TWO | Adding weight to the hopper



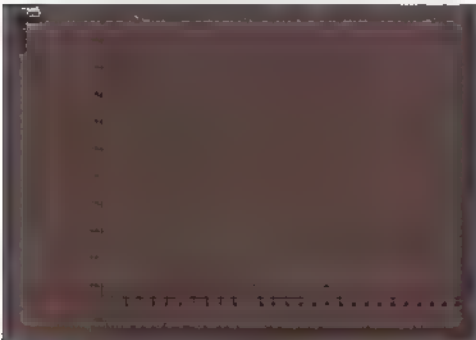
04 The spacing, timing and amount of deformation all play a vital role in describing the hopper's overall characteristics. The bounce will take about one second, which is about equivalent to the pace of a person walking slowly. However, as we'll add two slight pauses (and due to the nature of the hopper), it'll be perceived more like a leisurely bounce.



05 As discussed last issue, we'll need to add some squash and stretch to the hopper - although this time we can exaggerate the contact position further. Activate the Scale tool and make sure the Volume button is enabled. Go to frames 1 and 27 and press [K]. Set a keyframe for all three axes. At frames 13 and 18, scale the hopper to about 1.2 on the Y-axis and set a keyframe.



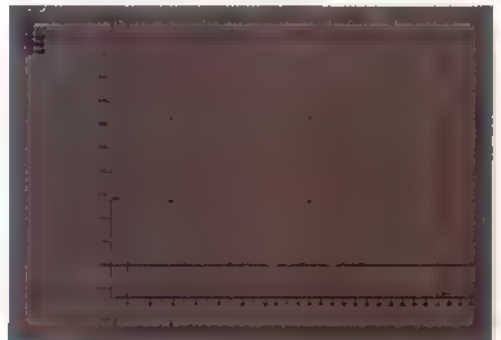
06 Go to the contact position at frame 14. As the hopper hits the ground, he's not only squashing because of gravity (and the fact that his made out of rubber), but also to regain the energy needed to push himself off the ground again. Scale him down to about 0.6 or 0.7 for the Y-axis and set a keyframe. Move him back down to the ground and set a key for the Y position.



07 With the hopper still selected, press [O] to open the Animation Editor. In the Animation Tree, select 'posy' (position on the Y axis) to display the corresponding f-curve and [F] to frame it. Select both high-point keys and set the left and right slope handles' length to about 9. Select the contact position's keyframe and set the left length to 2.5 and the right to 3. All slope handles' angles should be set to zero.



08 Frame 13 is the most important frame between frames 1 and 14. As the hopper falls, he'll remain in his stretched out position until the very moment he hits the ground. Therefore, the edge of the hopper should have just made contact with the ground at this frame to attain the best visual impact. This can be controlled through keyframe 14's left slope handle's length on the posy f-curve.

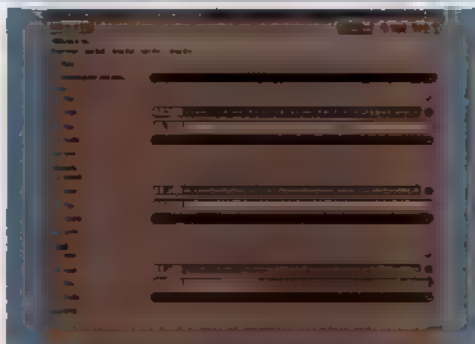


09 Select the scbx, scly and sciz to display their f-curves. Select all three keyframes at frame 1 and set the slope handles' length to left 0 and right 2.8. At frame 13, to 4 and 0; at frame 14 to 0 and 1.3; at frame 18 to 0.4 and 2.5; and at frame 27 to 11 and 0. Select all the keyframes for the scaling and press [Shift]+[O] to flatten the keys. Play back the animation to see the results.

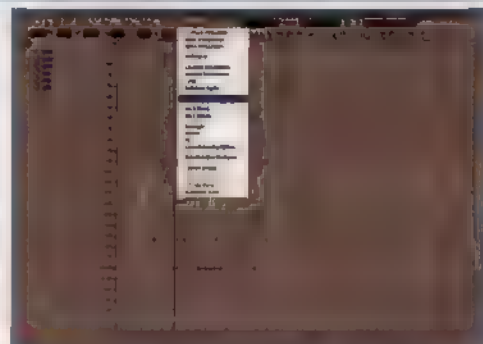
STAGE THREE | Boost the hopper's character



10 Next, we'll apply a deformer to get some additional motion within the hopper. Close or minimise the Animation editor and chose Model > Modify > Deform > Quick Stretch. This automatically deforms an object based on its motion and the values you enter. Since we've already added our own squash and stretch, we want to tone down the effect of the deformer, and make it more subtle.

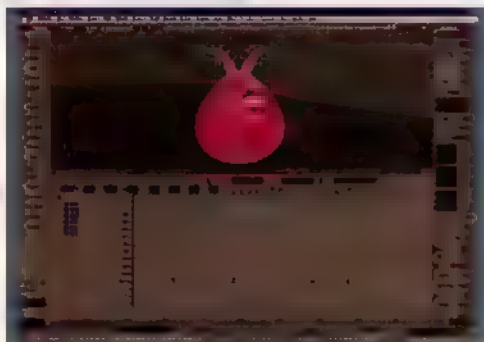


11 In the QStretch Property Editor, switch to the Lin Vel tab. The effect of the default Flex values is a bit too prominent, so decrease the Flex Ampl. to 0.003 or 0.004. Click the Yield checkbox to enable it. Lower the Yield Ampl. to about 0.003 and lower the Max. to about 30 to reduce the amount of deformation. It's a good idea to play back the animation and try out different values.

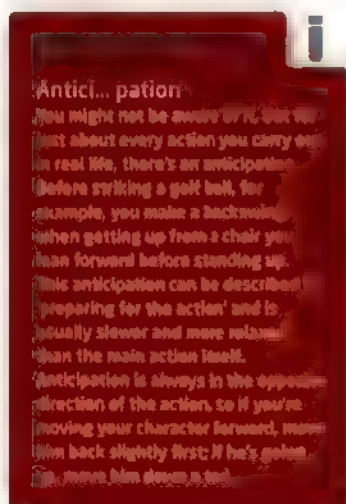


12 Open the Animation Editor. Select the hopper to display the f-curves and select all four. From the Curves menu, click Cycle. This cycles the f-curves, and any changes made to the keyframes, throughout. Click the Curves menu again, but choose Freeze Cycle. Enter 1 as Start and 79 (or as many frames you want) as End. This creates a new curve, where we can modify the cycled keyframes.

STAGE FOUR | Anticipation - preparing the action



13 The final step is to set an initial state for the hopper. Like other creatures, the hopper doesn't have the suppleness to be able to make a jump from his starting position - he needs to bend down to gain the energy needed to get off the ground first. Apart from being true to real life (see the Expert Tip below), this enhances the action and signals to the audience what's going to happen next.



14 Select all the keyframes (on all four curves) from frame 1 to frame 13 and delete them. Close the Animation Editor and go to frame 6. Activate the Scale tool and set the hopper's scale back to 1 for all three axes. Press [K] to set a keyframe. Next, move the hopper

slightly upwards so he rests on the ground and set a keyframe for that position as well. And that's it! Continue experimenting with the scene on your own: as a guide, try to avoid too much uniformity. Try altering the high points of the hopper or make changes to the timing of each bounce. ●

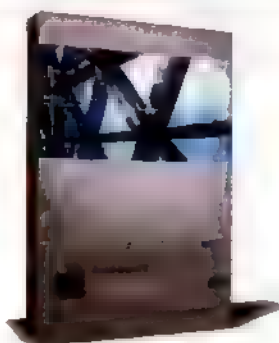
DOSCH DESIGN



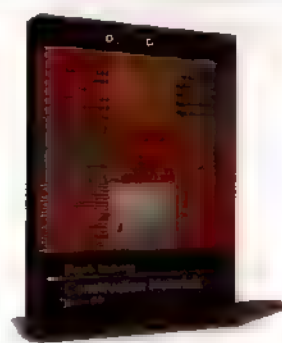
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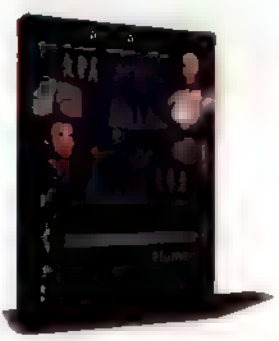


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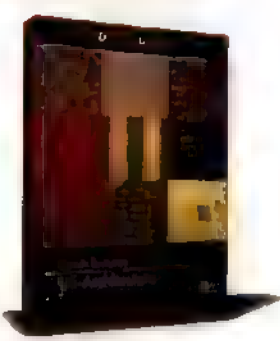
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It's easy to toggle between two levels of smoothing in a scene, thanks to the simple MEL script created in this article.

In the first of a series of articles on coding for non-programmers, we explain the easy way to create a simple MEL script to toggle the smoothing parameters in a scene. BY JEFF RANASINGHE AND MATT ESTELA

BY JEFF BANASINGHE AND MATT ESTELA

create functions and all that jazz. However, even if you aren't a hardcore programmer, there's always the option to use MEL to tackle those specific problems that you encounter from day to day in production.

In this article, we'll show you how to solve a fairly common problem: the need to toggle the models in a scene between two different levels of smoothing. Rather than select all the models by hand to switch between unsmoothed (for ease of animation) and smoothed versions (for final display), we're going to create a simple Macroscript to do the job automatically.

This is fine, but how can we do something useful with `l`? Like the Windows or OS X equivalents, many Maya commands have extra options, called switches. The `ls` command has a switch that tells Maya to show only the selected objects. Create a few more objects, select some of them, and run



You should be rewarded with something like this.

```
## Result: rubeSphere1 resultsCube1 bottomHubsCube1
```

Although we're now able to list selected objects in the scene before Moyo can actually do anything with them, we need to store that list somehow. To store information, use the following syntax:

```
if ($?) {
    $value = "MCL is really boring so far"
}
```

The dollar and equals sign are important and must always be there, but the rest you make up. This is fine if you know what information you need to store, but what if that information changes? In our case, the information is the objects that have been selected, and so this will change quite often. To get around this problem, we need to get the `list` assigned to a variable. For that, you wrap the command in backticks. The syntax will look like this:

```
!Selected = 'ls -sl'
```

Try running it. The results should look the same as before but what

FOR

$$h^1(\mathcal{O}_{\mathbb{P}^1}(-2)) = 0 = h^1(\mathcal{O}_{\mathbb{P}^1}(-1)) = h^1(\mathcal{O}_{\mathbb{P}^1}) = 0$$

DIFFICULTY

11. 12. 13. 14.

TIME TAKEN

\square

ON THE CD

- [illegible]

ALSO REQUIRED

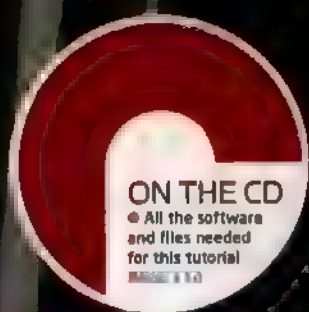
Nothing

If you've used a DOS prompt under Windows, or the Script window in OS X, you should recognize the `dir` or `ls` command, which lists the contents of a directory. *Maya* has its too, and it lists the contents of your scene. Load the test scene (`preSmoothMaya.ma`) from the TD and we'll begin. In the Script editor, type:

ks

in the Script editor's menu bar, choose **Script > Execute**. You should get something like

```
// Result: time1 renderPartition renderGlobalsList1
defaultLightList1
```

ON THE CD

• All the software
and files needed
for this tutorial

• **Assets** • **3D**

MOTIONBUILDER

Lock 'n' load!

This tutorial takes you through tweaking a game character's mo-cap data in MotionBuilder 6 PLE, free on this issue's CD. You'll be making your own Getaway in no time... **BY LLOYD BURR**

FACTFILE

FOR

MotionBuilder 6 PLE
MotionBuilder 6
Standard

DIFFICULTY

Elementary
Intermediate

TIME TAKEN

One hour

ON THE CD

- Full-size screen grabs
- Asset folder and files
- Character rig files
- Animation

ALSO REQUIRED

N/A



animators rejoice! On this Issue's CD you'll find **MotionBuilder 6 PLE**, the package that's fast becoming a popular choice for motion creators and editors. This learning edition is a fully functioning version of **MotionBuilder Standard** that enables you to load files created in the commercial version and to save in a special FBL format. This means there's no excuse for not having a good tinker!

With a background in the games industry, I find **MotionBuilder's** speed and range of custom tools most beneficial. Using the 'story editor' moves can be blended, trimmed and tweaked in the same way as you would use a non-linear video editor. The unique characterisation process and FK/IK Control Rig tools enable the animator to work with a variety of different characters in an environment that's familiar each time. The ability to layer animation is essential when dealing with motion capture because keying onto a layer means you can keep all the data on the base layer intact.

In this tutorial we'll tidy up a gangster thug's ambush mo-cap data so it's ready for in-game use: correctly posed, positioned and

edited. As well as learning about key areas of **MotionBuilder** such as the Story Editor, controlling and keying, you'll also gain insights into some of the practises of the games industry.

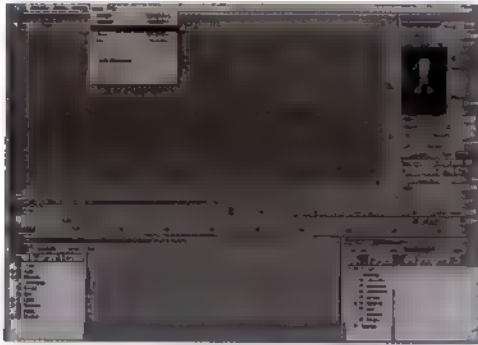
Before we begin, it'll be useful to familiarise yourself with basic navigation. There are a number of keyboard presets available. It doesn't matter which one you choose, but get used to how the keys work, especially the differences between navigating the 3D and 2D sections of the package (for example, the Schematic view toggled with [Ctrl]+[W] in the viewer).

On the CD as well as full-size copies of all the screen grabs used, you'll also find the relevant **MotionBuilder** data files too. Before you start, locate the folder 'Thug Assets' from the tutorial section of the CD and copy it to the root of your C drive. Once you've done that, we can begin the tutorial.

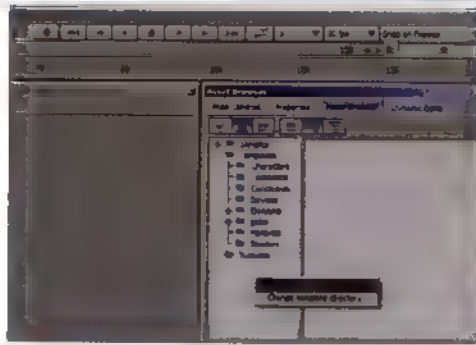
Lloyd is a Senior Animator at Sony Computer Entertainment's London Studio. He has worked on *The Getaway* and *Getaway: Black Monday* for PlayStation 2
[w] www.thegateway.co.uk



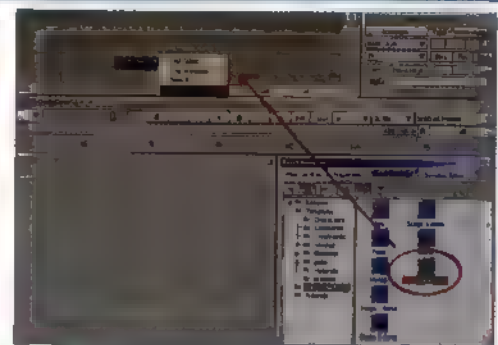
STAGE ONE | Preparing the scene



01 To start with, select File > New from the main menu. First, we need to synchronise layouts. In the main menu, select Layout > Editing. After the tutorial, take a look at the other layouts in this menu or even create your own. Before the next stage, read the last paragraph of the Introduction, which has instructions on copying a folder from the cover disc.

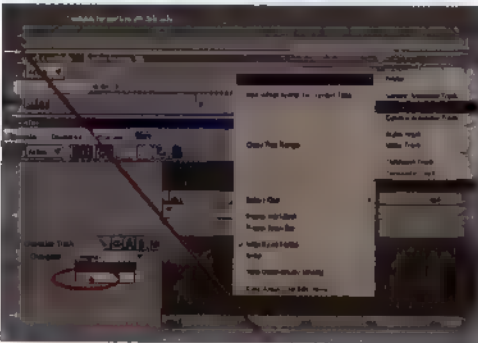


02 We're going to add a favourite path to the Asset Browser. This is simply a link to a folder but it greatly facilitates dragging and dropping files into your scene. Right click a blank area of the Asset Browser's left-hand column and select Add Favourite Path. Select the folder Thug Assets from your C: drive and click OK. The folder will now appear in your Asset Browser.

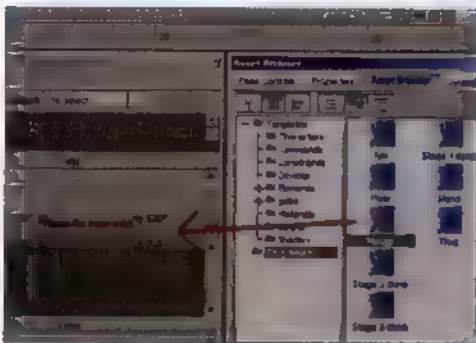


03 Click on the newly created Thug Assets and eight files appear in the right-hand column. To load the Thug character, left click and drag the Thug file into the Viewer window. When you release the mouse button, a pop-up menu appears. Select FBX Open > Options. Next, at the bottom of the Open Options window, choose Open and the thug character will be loaded.

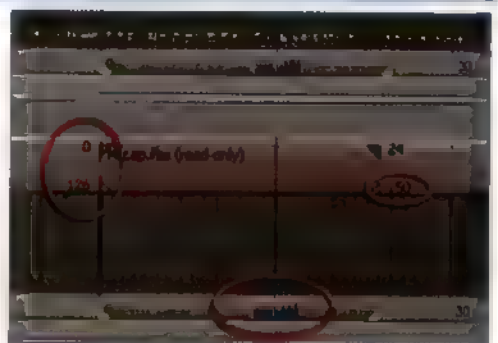
STAGE TWO | Remapping motion-capture data and blending poses with the Story editor



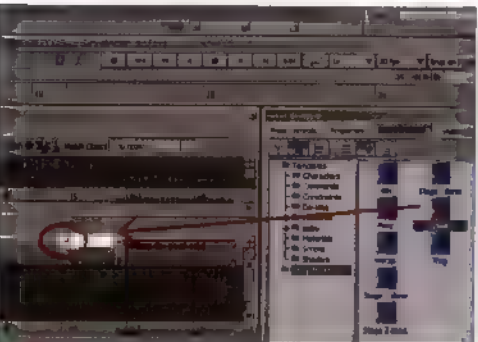
04 Select the Story tab in the Navigator window. Right click the dark grey area of the lower timeline and select Insert > Character Animation Track. Notice that a new Character track is created. Nearby there's a dropdown, which currently reads <none>. Click here and change it to Thug. MotionBuilder now knows which character to use.



05 From the Asset browser, drag the Mocap file anywhere into your newly created Character Track. A red clip will be added to the timeline; this is the animation data from that file. Select the clip and numbers will appear at each corner, representing the start and end frames. The top pair relate to story time, while the bottom two relate to the clip's local time.



06 The mocap data is now active, so why not scrub the purple time bar under the track to view it? With the clip still selected, double click on each of the lower numbers and enter the values shown above to crop off unwanted frames. After doing this, double click on the top left value and enter [0] to position the clip. You may need to zoom in a little now.



07 Using a predefined pose, we're going to alter the beginning of the animation. From the Asset browser, drag the file 'Stand' to somewhere left of the 'Mocap' clip. The length of this clip is already correct but we need it to be positioned in such a way that it overlaps the other and creates a blend. Select the new clip and change the top left value to 1.

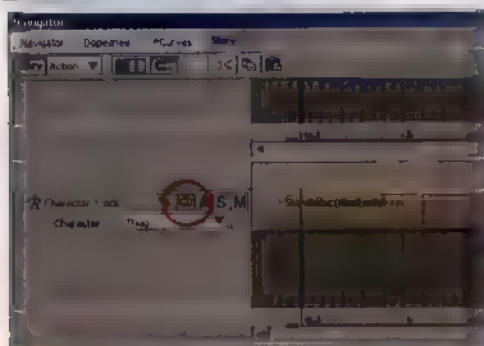


08 Now we have a cross-fade blend. However, if you scrub the timeline, it's apparent that the two clips don't match positions. Re-select the Mocap clip - we're going to reposition it in space so it matches the Stand pose. Click on the Match Option icon and enter the settings shown above (see the image on the CD if necessary), click OK and MotionBuilder will do the rest.

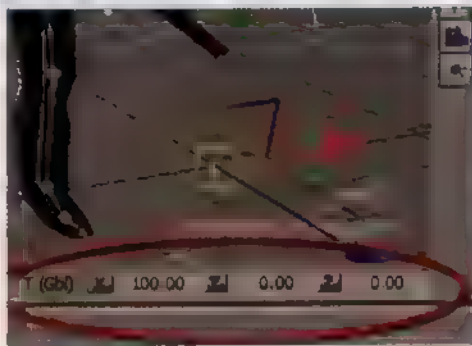


09 The Match tool has used the right foot joint as a reference point to align the clips. Scrub the timeline and you'll see the improvement. Now what we need is an end pose. Drag the Aim file from the Asset browser to somewhere right of the Mocap clip. Again, the length is correct, although you'll need to set the start-point. Change the top left value to 15.

STAGE TWO (Continued) | Remapping motion-capture data and blending poses with the Story editor



10 Scrubbing through now, you'll see that this end pose makes the Thug slide back to the origin. We could use Match again but let's say we know exactly where the end pose should be. Let's move the clip's ghost, or world-space point. Click the eye icon on the Character track to make ghosts active. If you want to see them, make sure that you're in X-Ray mode.

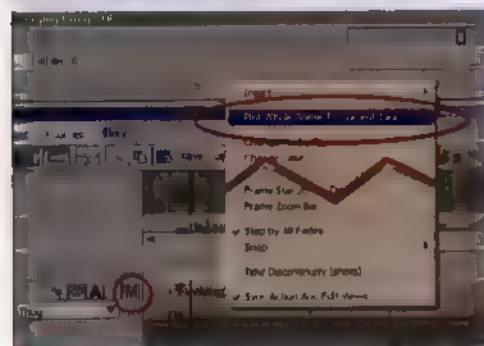


11 When the Match tool was used earlier, MotionBuilder automatically moved the Mocap clip's ghost. Now we're going to adjust the Aim pose's ghost manually. With Aim still selected, click in the Viewer window and press [T] (for translate). At the bottom of the Viewer window, type in the values shown in the screenshot above. Now scrub through and view the results.

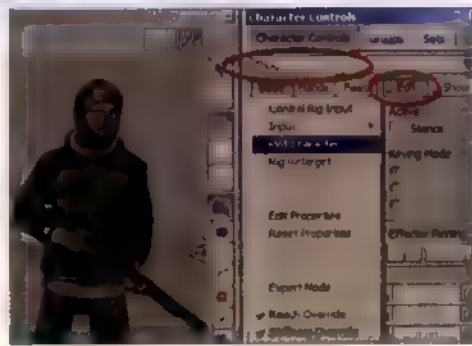
Different views

MotionBuilder has three viewing modes - Normal, Models Only and X-Ray - each displayed at the bottom left of the Viewer. With your cursor in this window, you can cycle through the modes using [Ctrl]+[F]. Changing mode can be useful since you can see the workings of the skeleton, ghosts or control rig. For speed reasons, it's handy to turn off Selective Redraw using the Pencil icon at the top right of the viewer. If speed's not a problem, drag the 'Filter' from the Asset Browser to the Viewer and select Filter Merges > Animation Set a useful placeholder.

STAGE THREE | Using an Auxiliary effector to constrain the left hand



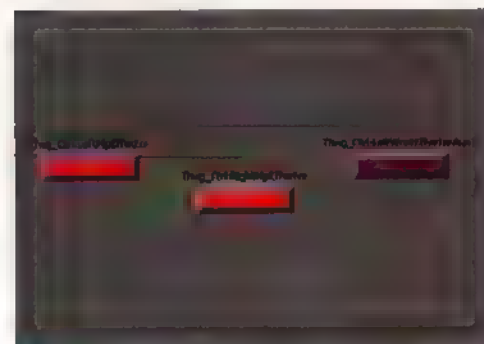
12 Right click somewhere on the Character track and select Plot Whole Scene To Current Take. Now click Plot at the bottom of the next window. This plots all of the story information to the Thug's skeleton. To confirm that the Story is no longer active, mute it by selecting the M icon. You should also experiment and see what happens if you mute before plotting.



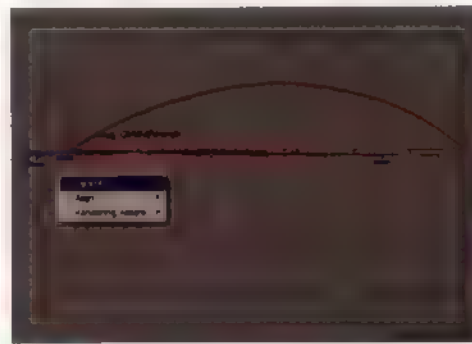
13 To fix the left hand position, we need to use a Control rig. We're going to duplicate the animation data that's now on the skeleton to a Control rig so we can use IK functionality. Select Thug from the drop-down menu in Character controls, then go to Edit > Plot Character. On the pop-up menu, select Control rig, and then select Plot on the next menu.



14 The Control rig can now influence the character but you won't notice any changes yet. The IK effectors can be seen when the viewer window is set to X-Ray display. They're selectable through the character picture in the Character controls window. Make sure the current frame is 24, then right click on the left wrist icon and choose Create Aux Effector.



15 A pink cube known as an Auxiliary effector is created at the same point in space as the left wrist effector, which itself is now constrained to the new auxiliary. Scrub the timeline to see the result, but be sure to return to frame 24 when you're finished. With the Viewer window active, press [Ctrl]+[W] to switch to the schematic view, then press [F] to focus on the auxiliary.

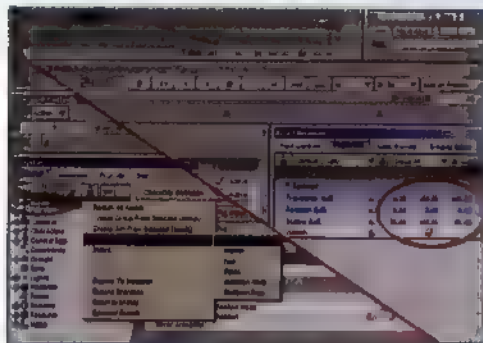


16 To get the left hand correctly positioned and following the right hand, we'll parent the left wrist auxiliary to the right wrist effector. Zoom out, then hold down the [Alt] key as you left click-drag the pink auxiliary on top of the right wrist effector. Let go of both keys and a menu pops up. Click on the Parent option and you'll be able to watch the Auxiliary move.



17 In the Viewer window, press [Ctrl]+[W] to return to the 3D view. Scrub the timeline and you should notice that the left hand is now following the shotgun. Auxiliaries are a very useful way of interacting with the control rig. Although this example is very specific, it's worth having a play with this feature to see what you can come up with.

STAGE FOUR | Editing the animation using the Control rig



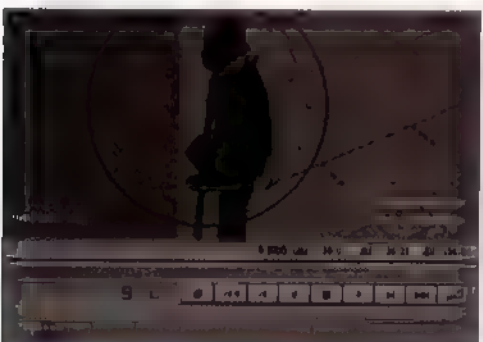
18 Let's create something for our thug to perform his ambush from. In the Navigator tab, right click on Scene and select **Insert Object > Cube**. A new cube will be created and automatically selected. Now go to the Properties tab and enter the values shown above to set the cube's size and position. You can check the screenshot on the CD if necessary.



19 Spin the view around so you can see the thug and then scrub the timeline. You'll notice that his shotgun is intersecting the new object. We can easily manipulate the rotation of the right wrist, and hence the shotgun, by animating on a layer. To animate on a layer, locate the Layer's drop-down in the Key Controls window and select 'Layer 1'.



20 Select the Right Wrist effector in the Character Controls window. Because we're animating on a layer and layers are additive, we must put keys at the beginning and end frames before editing starts, otherwise we'll change our start and end positions. Go to frame 0 and press [K] to set a keyframe, and then do the same thing at frame 24.



21 Now go to frame 12 and, in the Viewer window, press [R] to activate the rotation controls. Adjust the right wrist rotation so that the shotgun is no longer intersecting the object. When you're happy with the result, press [K] again to set a key. Notice how the left hand stays on the weapon, demonstrating that the auxiliary constraint is still working.



22 With the Right Wrist effector still selected, we can make the thug point the shotgun a little more purposefully towards the end of the animation. At frame 18, adjust the rotation again so the shotgun is pointing more or less forward. You might find that you have to add another key at frame 14 to stop further intersection with the object.



23 If you're feeling a little bit more adventurous, you can select the Hips effector (the green one in the middle of the character picture), press [T] and then translate them down on frame 12. This will make the thug duck a little as he jumps out.

Why not try some of the stages covered in this tutorial using the characters and animations that are supplied with

the Learning Edition of MotionBuilder? You can find them in the pre-installed folders of the Asset browser. Also, if you open up the Mocap.fbx file from Step 5 on its own, you'll notice that the motion is actually on a different skeleton set up - all of the retargeting was handled behind the scenes.

Above all else, experiment with the software. Check out the help files when you need to and enjoy yourself! ●

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"DON'T PANIC!"

As *The Hitchhiker's Guide to the Galaxy* fulfils its creator's dream and makes its long-overdue cinema debut, VFX contributor Cinesite reflects on the importance of detail, infinity and second heads... **BY CHRIS WATSON**

FACTFILE

PROJECT

The Hitchhiker's Guide to the Galaxy

STUDIO

Cinesite, Chicago

CLIENT

Mediaset Italia
25th Street Studios
London, UK + HHK

CONTACT

+44 (0)20 7434 4444

WEBSITE

www.cinesite.com

START DATE

1994

SELECTED CREDITS

Chaplin, *The Godfather*, *Indiana Jones*, *Forrest Gump*, *AVP*, *Alien vs Predator* (2004), *Harry Potter and the Prisoner of Azkaban* (2004), *King Arthur* (2004), *The Matrix*, *Robin Hood: The Prince of Thieves* (2003), *Band of Brothers* (2001)

• Arthur Dent (Martin Freeman) and Marvin the Paragoid Android regrettably enjoy the weather of all planets on Magrathea, composited from countless Earth examples

"The shots are incredibly diverse. You've got everything from spaceships to alien creatures, and blue whales to bowls of petunias." You could be forgiven for thinking that Matt Johnson, Visual Effects

Supervisor at Cinesite Europe, has finally succumbed to the pressure of the company's latest job, but he's not making this up. After all, he is talking about the imminent film version of *The Hitchhiker's Guide to the Galaxy*, Douglas Adams' much-loved radio series and the first of a 'trilogy' of five books.

For the fans, there's a lot riding on this big-screen outing, scripted largely by Adams himself before his death. Until now, the only visual version of the book was the BBC's surprisingly accomplished 1981 TV series, albeit with *Doctor Who*-level effects (for more on these, see page 111). But Cinesite, which completed more than 500 shots on the film, is confident it'll retain its unique charm: "The film has a very distinctive style," says Johnson. "It's a very English style in many respects. Garth Jennings [the director] was very much into imperfection. That's not to say he wanted the shots to look bad, he just wanted them to look as if there was a camera there, a sort of 'Oh look, something over there! He didn't want to suddenly switch from one style to another, so that every time we did visual effects it would be like *2001: A Space Odyssey*."

One notable example of this Englishness comes early on in the story, with the destruction of the Earth. Vogan spaceships amass around the globe and, as the camera crash-zooms out into space to jarring countdown music, the sheer number of them becomes,

● The planet factory on Magrathea (actually, in an alternate dimension) features some of the heaviest CG work in the film, while living up to the hyperbolic description in the book: Mr Adams' head-planet floats serenely in the background.

► apparent. There's a dramatic pause, and then... the smallest, most pathetic explosion you've ever seen. Johnson laughs: "You think it's going to be like the Death Star, but no - it's rubbish."

The Vogon spaceships themselves are very simplistic, much like enormous tower blocks. A mixture of three-metre-high miniatures and CG was used, with texture maps digitised directly from the miniatures. Funnily enough, this basic shape made adding detail more difficult and, because the camera moves very

close to a ship in one shot, the textures were taken at 4000 x 4000 res. "One of the challenges was a shot where there are 15,000 ships on screen, which is one of the most we've ever done," explains John Neill, 3D Supervisor. "They're stretching off to infinity in all directions. Obviously, the renderer just falls over at that scale, so we had to keep optimising to get anything out."

"We used particle replacement there, and put a small amount of hover on each ship as well. You don't really notice it, but it's a thing you might see out of the corner of your eye." The Heart of Gold, however, is entirely modelled and rendered in CG. This 'hero' ship, the characters' main form of transport, looks very different to the BBC series version. "It's actually based upon a typical porcelain teapot, with a mural at the front of the spaceship," says Johnson. "It's like a willow pattern, consisting of various scenes from the story but featuring members of the production crew, such as the director and producer."

"LOGISTICALLY, YOU HAVE TO THINK IF YOU'RE FILMING THE ACTORS, YOU'RE NOT GOING TO BE ABLE TO FLY THE CAMERA A MILE BACK IN SPACE IN TWO SECONDS"

MATT JOHNSON, VISUAL EFFECTS SUPERVISOR

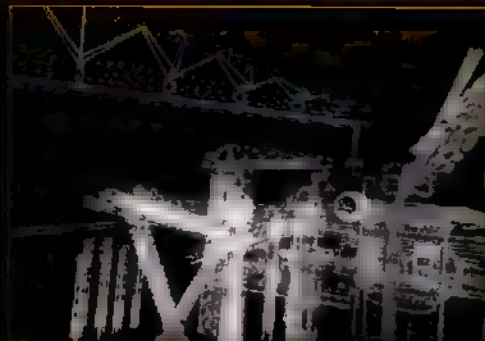
● Digital mattes were used extensively for backgrounds where parallax wasn't necessarily needed, so vast were the distances conveyed.

THE INFINITE IMPROBABILITY DRIVE

The Heart of Gold's legendary improbability Drive consists of a complex collection of intermeshed rings, and was originally meant to be shown off with a camera fly-through. "We made 2,000 textures for every element in there," says Neill. "Eventually, of course, they didn't use the shot, so we did all that work for nothing. But we know it's there!"

Because the Heart of Gold is so prevalent in the film, Cinesite adapted their usual *Maya* and *RenderMan* techniques to optimise frame times: "We did it in a way that generated 20-odd passes per shot," explains Johnson. "So we could separate out the highlights, shadows, reflections, specs and things like that, to get quite an interactive look going. Rather than re-rendering the CG, we'd just dial up a spec pass and make it shiny, or take it down, so there was a lot of creative control in matching it in with the lighting. Some of these renders were many hours per frame,

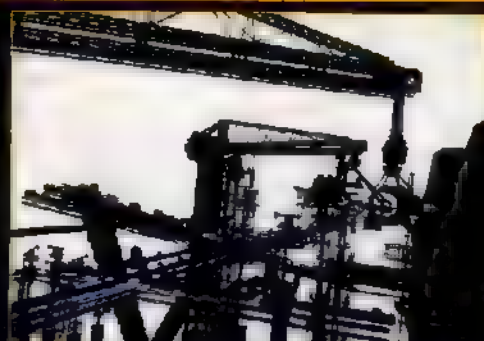
IN FOCUS | Welcome to our cold, dead planet... How Cinesite made Magrathea's 3D world factory



01 This proxy version of the planet factory construction framework was of particular use in the early stages of shot development, when the architecture and structure of the plant was still evolving. Use of the proxy version resulted in more efficient management of the lower level of detail required to make fundamental decisions.



02 The shaded proxy version (this one created with the default light source) allowed for smoother evaluation of lighting decisions. Working closely with the production's art department, the design process was very fluid, and the proxy version allowed for initial, fundamental decisions on structure, animation and camera position to be made.



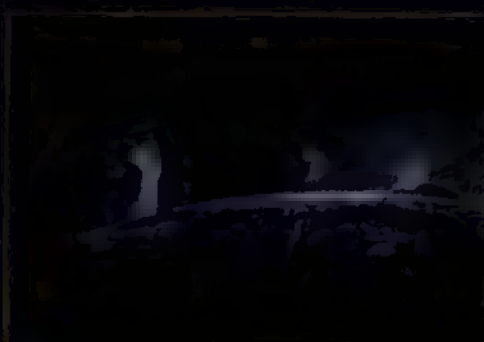
03 Cinesite's technical team wrote a new proprietary system, working in conjunction with *RenderMan* and the modelling process, to integrate three levels of detail: complex, medium and basic. This system allowed for intelligent selection of the most appropriate detail version, according to the model section's distance from the camera.



04 This (highest-resolution) version of the planet factory framework was split into around 15 separate layers in order to expedite the time-consuming rendering process. A palette of approximately 50 separate textures were created and used, although this detail often appears invisible. They include concrete, rust, pipes and metal details, like bolts, joins and rivets.



05 Backgrounds for this sequence were created as digital matte paintings, giving an ethereal sense of atmosphere and scale while keeping the working methodology as simple as possible. The metal planet, which appears in the lower foreground of the shot, has a corroded texture, which was created using photographic references of industrial surfaces and metals.



06 This matte painting projection covers the entire panoramic camera move throughout the shot. The planet factory is an abandoned galaxy filled with unfinished planets. *Hitchhiker's* fans will no doubt spot the subtle tribute in this background element: the 'Head planet' exhibits the features of Douglas Adams, created from a 3D scan made before he died. Brain the size of a planet indeed.

so it's easier to do it in compositing." Indeed, this lighting pipeline was used throughout the film, and will now feature in future projects, thanks to its versatility.

"Bruno Lesieur came to us to set it up - he developed it here and wrote the code," says Neill. "We also had to create the GUI interfaces as well, so it's easier than typing abstract commands, and it allows the user to move easily. We made it scalable, so you can have 20 passes if you want but if you only need two, you can do that too without clogging up the renderer."

Probably the most CG-intensive sequence in the film involves the planet factory on Magrathea, where *Slartibartfast* designs entire new worlds (see the walkthrough for more). Unsurprisingly, it resembles a vast construction yard, bristling with pipes, girders and rigging, all constructed in *Maya* and rendered against extremely high-res digital mattes.

The sequence is most alive at the factory courtesy of a hurtling hyperspace ride, which again mixes real footage and CG replacement. Neill explains: "They were shot against bluescreen on a motion-based mover, which is like a cage that



Marvin the Paranoid Android, *H2G2*-style. Adams once said he had no idea how the robot should look, except that it should be somehow ungainly

The Vagon spaceships proved to be a good compromise of three metre-high miniatures and their CG equivalents
www.3dworld.com

► turns and rotates, like a virtual reality ride. We made a virtual rig that sent information into the physical rig, so we did a pre-viz in *Maya* and the real rig would do exactly the same moves against the bluescreen. The film negative was then brought into the *Maya* scene and all we had to do was scale it up and down to fit."

Half the shots were done with the real cage in which the characters sit, and half with the blue pull. "We could replace it with the CG cage, just in case the angles weren't quite right. You can get away with figures being sat there, but not a real cage. So the CG was put in to make it work."

"GARTH JENNINGS [THE DIRECTOR] WAS VERY MUCH INTO IMPERFECTION. HE DIDN'T WANT THE SHOTS TO LOOK BAD; HE JUST WANTED THEM TO LOOK LIKE A CAMERAMAN WAS THERE"

WAT F. JOHNSON, VISUAL EFFECTS SUPERVISOR

This same system, developed by Cinesite, was used for the flying sequences in *Harry Potter and the Prisoner of Azkaban*. "The directors always envisage these incredibly sweeping camera moves," says Johnson. "But logistically, you have to think, if you're filming the actors, you're not going to be able to fly the camera a mile back in space in two seconds. So there's some pretty complex maths to scale the movements, do the rotations, and fit it in with the 3D environment."

Cinesite developed yet another new system for a sequence near the end of the film featuring talking mice: "That was largely a model replacement," says Johnson. "The director liked the random look of real mice, so he kept scaling back from full CG models to just having a few elements in CG, like the jaw." But the team weren't happy with the existing fur rendering solutions and wrote their own instead: "Nothing out there seemed to suit it," explains Neill. "We couldn't get that clumping look that you have in mice fur. You can't really notice now, but the whole front part

is CG, round his nose and eyes." This freedom to simply create entire new systems is one of the advantages in working at a large facility, he says: "It's also more of a long-term plan because we're going more into creature stuff, so it's good to have something you've got control over and can add to."

TWO HEADS ARE HARDER THAN ONE

And what of Zaphod Beeblebrox's infamous second head? In the BBC series, it lolled about rather embarrassingly on actor Mark Wing-Davey's shoulder looking every bit like the mechanical prosthetic it was. For the film, rather than spending the entire effects budget, shot count and, indeed, production time rendering a head, a simpler approach was taken. Zaphod still has two heads, but the second is essentially buried beneath his chin, only popping out occasionally to interject a few fevered words. The 'real' head tilts back, with Zaphod's beard becoming the new head's hair. And even this compromise proved to be quite time-intensive to bring to the screen.

"Half of those shots are 2D and half 3D, so when he's not moving much, it's 2D," explains Neill. "We projected textures of Sam Rockwell's performance onto 3D geometry. There's a simple *Maya* model of his scanned head with 16 various expressions like mouth open, eyes wide and so on. The 3D hair blends into his beard. It was one of the more complex and difficult things to do, but it's not going to stand out as one of the big CG effects."

Neither will the very last image of the last shot of the film, but anyone who manages to catch it – or freeze-frame it on DVD – will appreciate just how much loving detail Cinesite has crammed into *Hitchhiker's*. Somewhere, in an alternate universe, Douglas Adams is smiling.

The *Hitchhiker's Guide to the Galaxy* is released on 26 April in the UK and the following day in the US. For more, see the official site at: [w] <http://hitchhikers.movies.go.com>



► New character Humma Kavula (John Malkovich) sports some tiny metal CG legs, animated in *Houdini*

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● Pre-visualisation work for the Durrat Al Bahrain project means decisions can be taken before committing to building. This crescent island is probably going to be connected directly to the mainland, instead of having bridges from it, saving millions of dollars.

Khalid Al-Muharrraqi

We speak to the son of a famous Bahraini artist about how he has transformed pre-visualisation for a multi-billion-dollar terraforming and architectural project into an art form

BY BEN VOST

Tell us about yourself...

I'm the son of Abdulla Al Muharrraqi, a well-known Bahraini artist. Throughout my childhood, I was exposed to the environment of art and colour. My father had tons of books, so I had a lot of different artists and many different worlds to learn from. Additionally, he showed me the traditional ways of painting, the anatomy of the human body and how it works, how sketches are thought through and the best way to execute them.

He was my best teacher, not only because he was a father who wanted his son to learn, but also because he was the best artist in the area. He has illustrations on the walls of palaces all over the Arabian countries, and the rulers of this part of the world knew him well for his unique contribution to art. In addition to his cartoons that depicted daily life and spoke with the voice of the people.

When did you see LightWave 3D for the first time?

The first version I worked on was back in the '90s. I think it was version 5 or 5.5. Then, in early 2002, I was going through some 3D illustrations on the net and stumbled upon a few stunning images. When I checked on the software these artists had used, I found that it was LightWave 3D. After that I got a demo version of version 7.0 and I started to like Modeler. I had a few comments on Laynit, but

when version 7.5 was released and I saw the potential and flexibility of the package, I was bowled over. That's when I thought I will happily admit that I had been struggling over the last few years to find a solution for my needs and I was very happy to discover that in one box LightWave has been my best friend since then. It has proved to me that it is the tool that best fits my painting skills.

What do you like about the package?

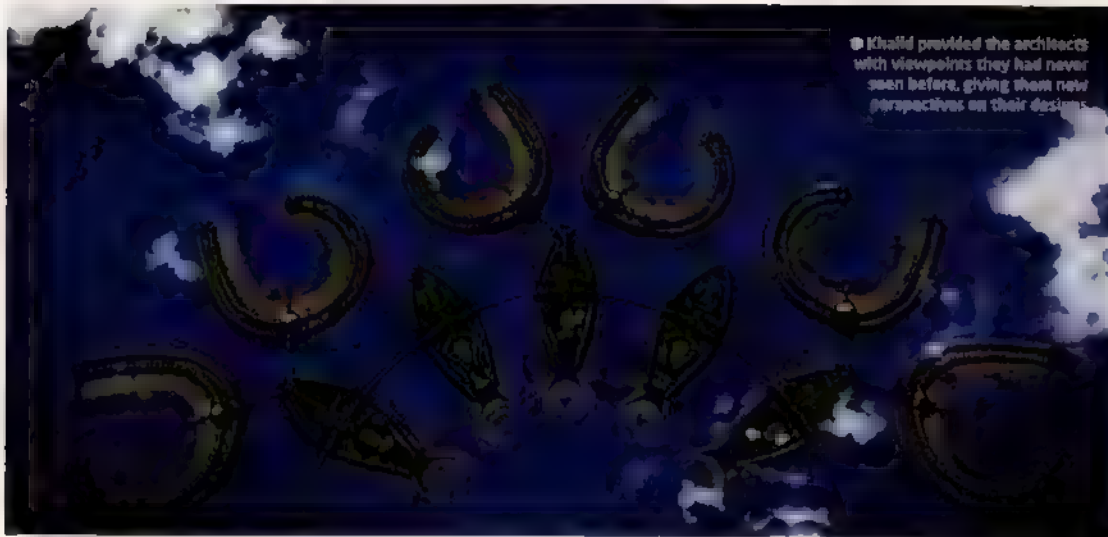
When I look at the interface, I still can't believe that although it looks simple, it can help me create such excellent results. Most of the other major software titles have worked on making their layouts attractive, with LightWave the layout doesn't look all that impressive but the workflow is fast and that means a lot to me. I rarely need to look down to my keyboard or search for a button, think it's vital to move around quickly and have a good workflow.

What spec machine(s) are you using it on?

I'm currently using a Mac (5.2GHz dual processor with 4GB RAM and an Nvidia GeForce 6800). However, I've been using Macintoshes for 13 years and I was very disappointed to find out that they don't have many good quality 3D cards on the market, and to me that's a huge drawback. I would happily pay more for my machine but not



● The hotel island was built from pencil sketches provided by the architects and took only four days.



double the price for something that doesn't provide me with double the performance. As a result, we recently been converted to the dark side when we purchased five AMD Opteron machines for our in-house render farm, which NewTek Europe has helped me to set up.

Tell us how you came to be involved with the Durrat Al Bahrain project.

I created another architectural walkthrough in Bahrain that had been seen by the client. The project was approached directly. There were other local and international bidders for the work, but they chose me.

Can you tell us more about the project?

Durrat Al Bahrain is one of the biggest projects in the history of this country. It's worth over \$1.3 billion and will add 13 islands on the southern coast of Bahrain. It's another in a long line of terraforming projects in the Arabian Gulf and it's a landmark that will be clearly seen from planes traveling overhead.

The development as a whole will have over 3,000 villas spread out over seven atoll islands and five petal islands, as well as more villas on the mainland. There will be a central island called the Pearl Oasis, which will have a resort hotel and a water theme park. There will also be a very large crescent-shaped island that will have a large mall, more hotels, apartment blocks, commercial developments and shopping, recreational and service facilities. On the mainland, there will be a large marina, a golf course development and a mosque. It will be an entirely new community that will be connected to the rest of Bahrain via a new superhighway.

Did you work from pre-made models or did you model and texture everything from scratch?

The architects designed the concepts and then got the budgets worked out with the client. I got the concept designs in line art floor-plan style, so I had to model and texture everything from scratch. I modeled the islands, added textures, environment and lighting, and finally made animations. We also got some actual satellite images of Bahrain, some of which were as big as 900MB, and there was a lot of painting onto the maps in *Photoshop* with my Wacom Cintiq pen and monitor. My first set of islands was built inside 15 days with *Lightwave 3D*.

Are the renders for print or animation?

Everything is needed for this scale of project and there's no end to what it's used for and where it goes. Interestingly, the architects had never seen the islands from the views I provided, so they used my visualisations to improve their designs, working on adjustments as I was building them in *LightWave*. I think I was faster at building in 3D than they were at coming up with new designs!

After the first set of images, the first phase of the project was sold out immediately and now phase two is sold out as well. We'll be releasing an animated fly-through of the whole development next.

How long have you been working on the project?

Almost three months. The first set of images was done in 15 days.

Did you paint your textures for the Durrat work by eye, or did you use GIS maps for added realism?

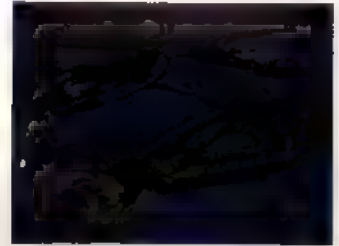
A bit of both. I got the satellite maps from the clients, then I painted the areas that had the manufactured land coming onto the scene.

Any final words?

I'd like to say that I wouldn't have done this work if it wasn't for my friends' support. To my best friend and business partner Rashad, who has motivated me a lot when I've needed it. I'd like to say "Don't worry - we'll do the movie project soon!" Then, of course, there's my beautiful wife and a gorgeous Korean girl. She stays up with me on those late nights and gives me much-needed company. Finally, my creator, Abdullah, my father. He's the influence that made me what I am today and I always look up to him as my mentor. ●



● The development at Durrat Al Bahrain includes six atoll-shaped islands (above) and five petal-shaped islands (below).



● The project has 3,000 villas, modelled in *LightWave* for one scene, with no instancing. The scene includes 3,370,321 polys.



● The petal islands contain about 72 villas each, while the atoll ones house around 180 villas each.

MORE INFORMATION

Khalid's website has many images of Durrat and his other work. It's available at [w] www.muhammadi-studios.com. The official Durrat Al Bahrain site is at <http://durratbahrain.com>.

ABOUT THIS ADVERTORIAL

This story was created by NewTek Europe in partnership with *3D World* magazine. Read the full version in the Community section of the NewTek website [w] www.newtek-europe.com.

Q&A

SOLUTIONS / FIXES / ADVICE

• 3ds max 7 doesn't have a native volumetric cloud and smoke system, so creating realistic clouds like this requires a bit of fiddling to generate the desired result

QUESTION OF THE MONTH

Submitted by
Geoffrey Addams, via email

3DS MAX 7

"How can I create a cloudscape with 3D volumetric clouds?"

FACTFILE

FOR

3ds max 7

DIFFICULTY

Intermediate

TIME TAKEN

One hour

ON THE CD

- Accompanying scene files
- Full-sized screenshot

ALSO REQUIRED

A good graphics card

This issue's answer is supplied by Pete Draper who is the VFX Director at Lightworx, Bristol. He has never knowingly watched *Highway To Heaven*, apart from that one time when his dad couldn't find the TV remote soon enough..

"Because 3ds max 7 doesn't have a native volumetric cloud and smoke system, you're going to have to do a bit of a workaround to generate the desired result. Have a look at some

actual clouds so that your reconstruction is effective. To make life easier, you'll distribute the clouds using a procedural texture with each cloud puff made up of a particle. This is quite straightforward, but you'll need to create two separate systems or branches within a single system to make two main sets of cloud particles, namely the cloud layers (three of them) and large billowing cloud stacks, which will emit from the layers you'll introduce. It's a pretty basic system to create in Particle Flow. The main meat comes in the materials where you have to try to simulate the volumetric cloud puff effect. You'll have to blend multiple map types together; a simple Noise map will be used to generate the texture of the cloud, and a Falloff map used

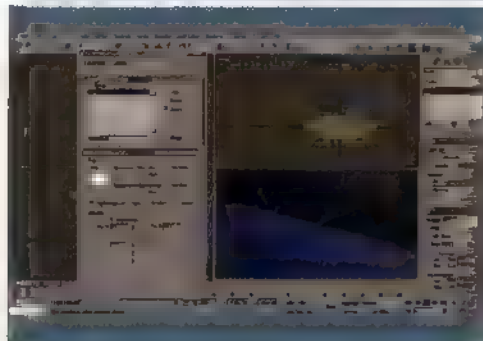
to remove any harsh edges of the geometry you'll use for your cloud puff particles. The hardest thing is the effect of backlit clouds, as you'll have a halo effect around the edge of the cloud where there's no illumination. A Translucency shader adds additional illumination of the material in shaded areas. You can then clamp the translucency to the outer edge by using the original Noise map (which generates the cloud shape) with a clamped-off version to mask out the internal parts of the cloud, suggesting density.

SILVER LINING

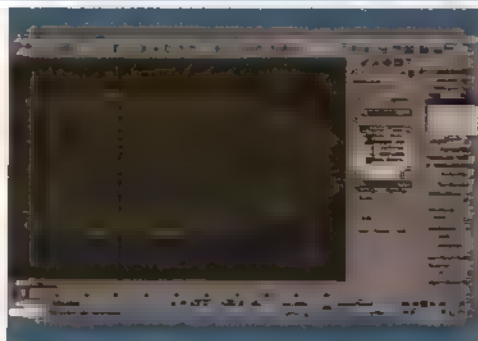
If you want a more realistic distribution of particles then, instead of using a Procedural map to distribute them over your scene, take a wide-angled vertical photo of some clouds and then tweak it in *Photoshop* to make the sky black and the clouds white(n). This can then be loaded back into *max* to be used to distribute the particles.

Due to the particle type used in this Q&A, the render times will be quite high as there will be multiple overlaid transparent faces that the renderer will have a tough time with. For a quicker render try replacing the particle geometry with facing particles, and use cloud sprites."

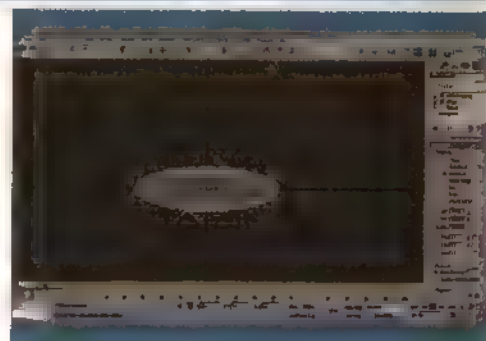
STAGE ONE | Analysing the starting scene



01 Open the cloud_start.max scene included on this issue's CD (see page 114). Here you have a basic scene setup with a Geosphere to simulate the sky, multiple instance lights to suggest the sun (so you have some side illumination on the clouds) and additional environment fogging which is controlled by settings contained within the camera.



02 The Geosphere is scaled using an Xform modifier so that the UVW Map modifier assigned to it isn't scaled. The UVW Map modifier's Gizmo is orientated so that it points to the Sun light by using the rotation controller of a dummy which is set to 'Look At' a point helper, which is linked to the central Sun light...

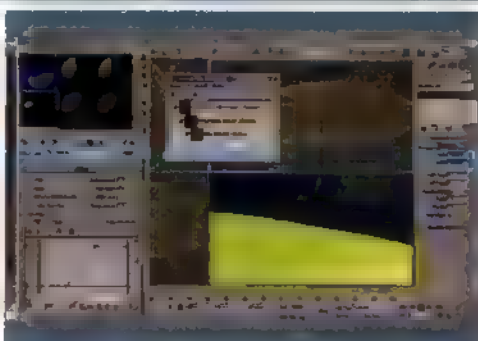


03 ...this is because you can't directly assign a Look At controller to the Gizmo so it's instanced from the Dummy object's rotation controller. This results in the mapped gradient in the Sky material assigned to the Geosphere always pointing to the light so that if you decide to reposition the light, the gradient will always follow suit.

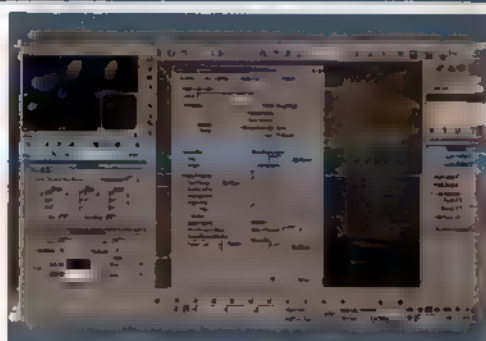
STAGE TWO | Creating the particle system distribution



04 Start by creating three plane objects to distribute the particles. In the Top viewport, create a Plane object with a length and width of 16,000 units called 'Cloud Plane Emitter Middle'. In the Front viewport, instance this plane vertically down about 1,800 units and call it 'Cloud Plane Emitter Bottom' and vertically upwards about 1,800 units and label it 'Cloud Plane Emitter Top'.



05 Open the Material editor and label a new material 'Cloud Plane Emitter Bottom'. Add an Output map to the Diffuse slot and drop a Smoke map into the Output map's Map slot. Set Source to Explicit Map Channel. Size to 0.5, iterations to 20, Exponent to 1 and Colour 2 to white. Back in the Output map, clamp off the Smoke map's colours by designing the Colour Map curve as illustrated.



06 Copy this material twice and label the copies 'Cloud Plane Emitter Middle' and 'Cloud Plane Emitter Top'. In the former, go into its Smoke map and set the Phase to 1, and set the Phase in the second copy to 2. Assign these materials to their corresponding objects in the scene. Select all three objects in the scene, right-click and select Properties. Turn off Renderable so they won't be rendered.



07 You're going to be using instanced geometry for your particle type as it gives you more control over mesh detail. Therefore you can tweak the number of segments in this object, which will be passed through your particle system. In the Top viewport, create a Geosphere with a radius of 30 and two segments. Label this object 'Cloud Puff'.

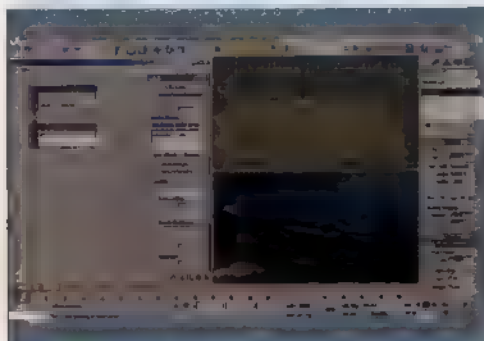


08 To generate random distribution of the particles, introduce a Wind Space Warp with substantial turbulence. In the Top viewport, create a Wind Space Warp and set Strength to 2, Turbulence to 10, Frequency to 2 and Scale to 0.12. In the Front viewport, rotate it 40 degrees clockwise so that any particles are distributed randomly along the direction of its icon.



09 Next, create the basic particle system before tailoring it for your needs. In the Top viewport, create a Particle Flow system. So you can see exactly what you'll get at render time, set the Viewport Quantity Multiplier to 100 and the Render Integration Step to Frame as there aren't going to be that many particles in your scene for your system to be bogged down.

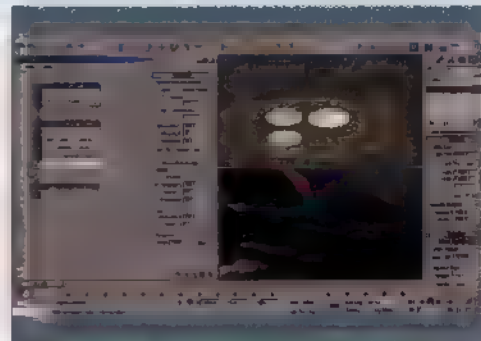
STAGE TWO (Continued) | Creating the particle system distribution



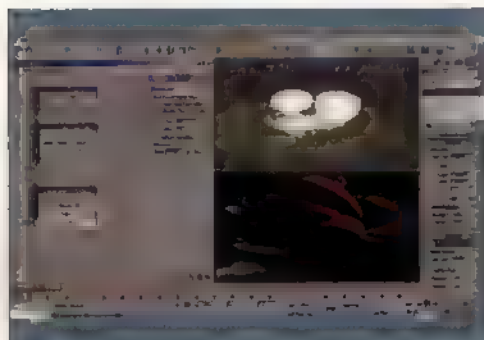
10 Open Particle View. Rename Event01 to 'Cloud Stack Birth.' Remove all operators except the Birth & Display operator. In this operator, set the Emit Start and Emit Stop to -Z0 and the Amount to 5. Drop the Display operator in the root event and set to Geometry. Add a Position Object operator and add the three Cloud Emitter objects from the scene.



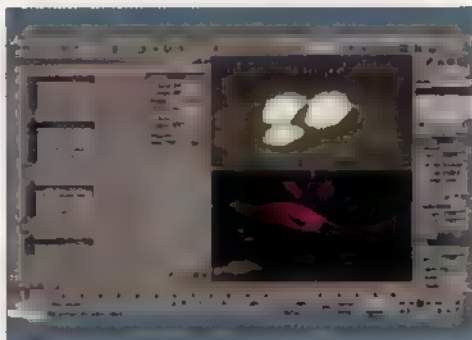
11 Enable Surface Offset, set Min to 200, Max to 300. Enable Density By Material, which uses the grayscale material to distribute the particles. Add a Shape Instance operator and add the Cloud Puff object to this. Add a Scale operator to the event. In the Scale Factor set, disable Constrain Proportions and set X and Y factors to 10,000; Z to 4,000. Set Scale variation to 1,000 for all axes.



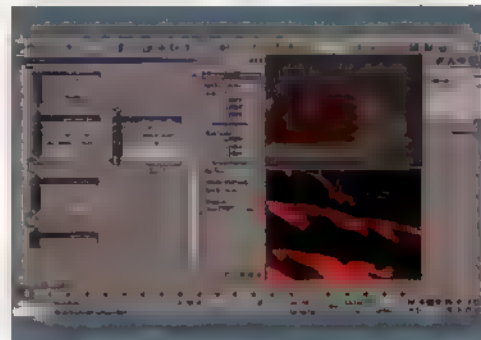
12 The Scaling squishes the instanced geometry randomly. Add a Spawn test to the event to create additional particles from these parent particles. Set the Offspring to 30 with 50 Variation. Instance the existing Scale operator to the canvas to create a new event, label the event Cloud Stack Distribution and wire the input of this event to the output of the Spawn test.



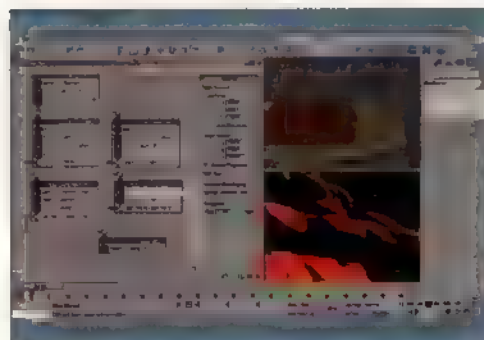
13 Add a Speed operator to the new event and set its Speed to 1.5 and Direction to Random 3D. Add a Force operator, add the Wind Space Warp to it and set its Influence to 5,000. To ensure that these particles don't travel off to infinity, kill their motion after a short while: add an Age test to the event and set its Test Value and Variation to 10.



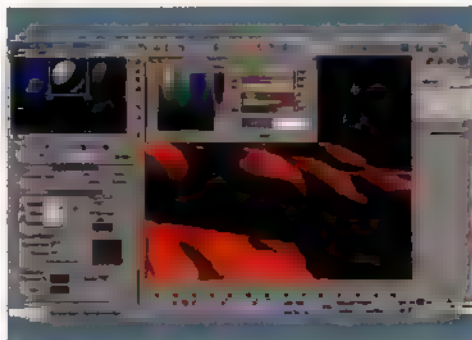
14 Drag out a Speed operator to the canvas to create a new event. Label the event 'Speed Killer' and wire its input to the Age test's output. This stops all particle motion after 10 frames with a variation of 10 frames. Finally, add a Material Stalk operator to the root node so you can add your cloud material to the entire system later on. Now it's time to create the cloud layers.



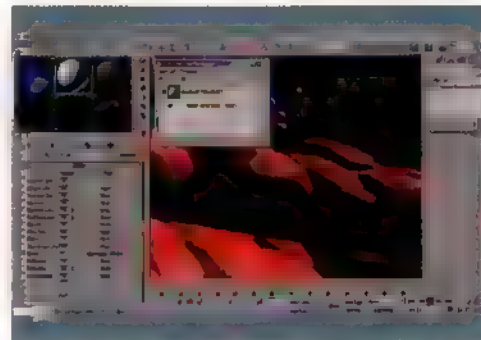
15 Instance Cloud Stack Birth to create a new event. Label it 'Cloud Layers Birth' and wire its input to the PF Source's output. Disable the Spawn test to speed up updates. Make the new Birth operator unique and set its Amount to 1,500. Make the Scale and Spawn events unique. In the Scale operator, set the X and Y Scale factor to 4,000 and Z factor to 1,500. Set Variation to 1,500 for all axes.



16 In the Spawn test, set Spawnable% to 10, Offspring to 5. Instance the Cloud Stack Distribution event and wire the Output of the new Spawn test as illustrated. Remove the Speed and Scale operators. Make the new Force unique and set its Influence to 1,000. Instance the Scale operator from the Cloud Layers Birth event to this event. Wire the output as illustrated, and re-enable the Spawn test.

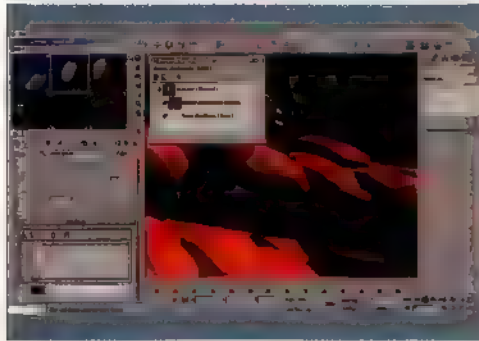


17 Open the Material editor and label a new material 'Cloud Puff.' You're going to be using a Translucent shader to simulate backlighting and transmission of light through the cloud. Set the shader type to Translucent Shader and set the Diffuse colour to white. Enable Self Illumination so you can introduce additional maps to affect its intensity and colour.

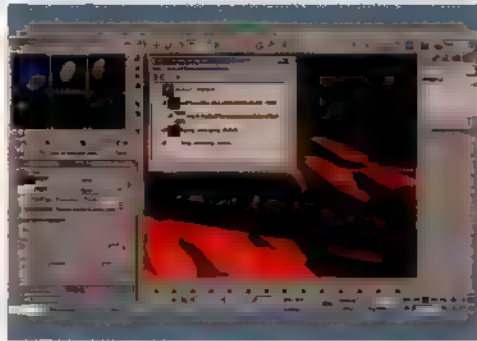


18 Start with the Bump map: it'll drive your cloud puff's shape. Add a Noise map to the Bump map slot and label it 'Cloud Bump.' Set its Noise type to Turbulence and Size to 1,600. Set the Levels to 10 to add more detail to the noise. Swap the colour swatches so that the bump is bulging out the right way. Back at the material's top level, amend the Bump amount to 20 so it's more subtle.

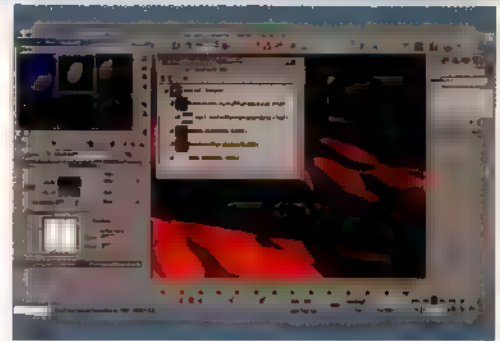
STAGE THREE | Remove harsh edges and add Self Illumination



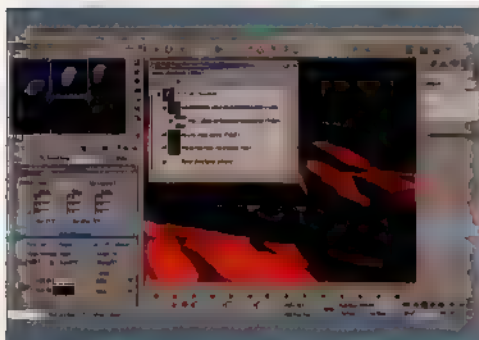
19 Remove the harsh edges of the material switch sample by amending the opacity of the material. Add a Falloff map to the material's Opacity slot and label it 'Cloud Opacity'. Swap the front and side colours so the front is white (opaque) and side is black (transparent). Amend the Mix curve as illustrated, so that you clamp off the opacity by bringing in the black transparent area.



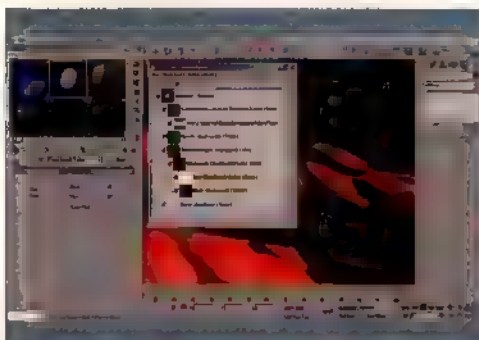
20 Add some additional Self Illumination effects by intensifying the Illumination of the cloud on the perpendicular of the lit side only. In the Self Illumination slot, add a Falloff map and label it 'Cloud Self Illumination Lit Mask' and set its Falloff type to Shadow/Light. Add another Falloff map to this map's Lit slot and label it 'Cloud Self Illumination Perpendicular'.



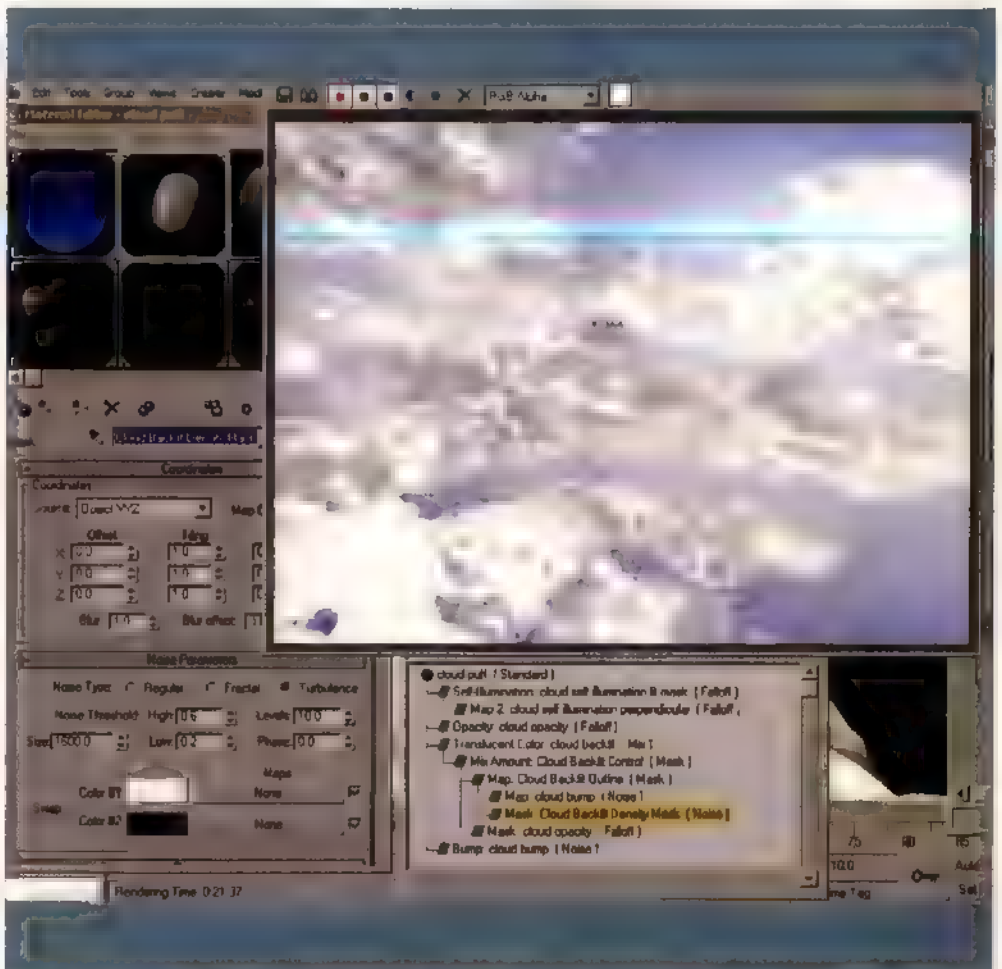
21 The final thing you need to add to your material is the backlit effect. As mentioned in the Introduction section, you'll have to mask out parts of the material so that the entire 'dark side' isn't affected by the translucent effect, only the outside of the masked Noise map. Add a Mix map to the Translucent Colour slot and label it 'Cloud Backlit'. Set the Colour 2 swatch to RGB 150, 150, 150.



22 This Mix map (the mixing of the two colours) will be driven by a masked version of the map used in the Bump slot. However due to the way that the translucency works, you can still have this effect on transparent parts of the material, so you'll need to mask these areas out...



23 In the Mix Amount slot, add a Mask map and label it 'Cloud Backlit Control'. Instance the Cloud Opacity falloff map to the Cloud Backlit Control Mask map's Mask slot. To create the outline effect, you now need to mask out the Noise map's internal 'dense' area. Add another Mask map to the Cloud Backlit Control map's Map slot and label it 'Cloud Backlit Outline'.



24 Instance the Cloud Bump map into Cloud Backlit Outline's Map slot. Copy this map (not instance) into the Mask map's Mask slot and label it 'Cloud Backlit Density Mask'. Amend the High setting to 0.6 and the Low setting to 0.2 to clamp off the colours in the map. Now open up Particle View and instance the Cloud Puff material to the slot in the Material Static operator. Finally, hide the

distribution and source particle geometry. If you find that your cloud project takes too long to render due to the extensive use of transparency in the scene, try one of the following two remedies: either reduce the particle count or number of iterations in the particle source geometry, or try replacing the particle geometry with facing particles and then use cloud sprites. ●

Q&A

Our experts
this month...

AFTER EFFECTS

Christopher Kenworthy is now working on various books, TV shows and films, as a writer, director and VFX artist
www.thedreamsequence.com

BODYPAINT 3D

Luke Stacy is head of training at Maxon UK. With over ten years of experience, he's an undisputed *BodyPaint 3D* expert
www.cinema4d.co.uk

CINEMA 4D

Adam Watkins is the director of Computer Graphic Arts at the University of the Incarnate Word in San Antonio, Texas
www.cgauhw.com

LIGHTWAVE

Benjamin Smith is Creative Director of Red Star, a VFX and animation company based in the north of England
www.redstarstudio.co.uk

MAYA

Gary Noden works at 422 Manchester in the north of England, where he's recently taken to swashing his buckle
www.422manchester.co.uk

PIXEL

James Smith currently runs SoupMedia, a design and illustration business, and Pixel Revolution Films
www.livingposer.com

RHINO

Neil Rennison is a freelance graphics artist. He's working on a number of mobile and handheld console games
www.neilrennison.co.uk

TRUESPACE

Andy Kay is a freelance 3D illustrator and modeler who specialises in architectural and product visualisation
www.ak3dgtfx.com

XSI

Ola Madsen works as a 3D artist for a company in Sweden, animating everything from medical treatments to furry teddy bears
www.digitalcontext.se

Quick Questions

No matter which 3D software package you use, our experts are here to help. Send us your query and we'll provide the solution: <http://forum.3dworldmag.com>



DOMINANT | UV guides for Photoshop

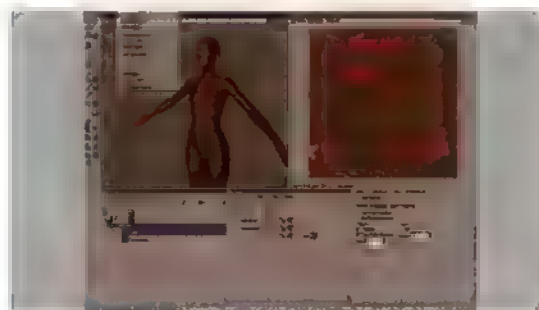
Q "I want to use *BodyPaint 3D*'s UV mesh as a guide for painting in *Photoshop*. Is there any way to save it as an image, other than via a screenshot?"
ROS, VIA EMAIL

A The command that'll help out here is Outline Polygons, which is located on *BodyPaint 3D*'s Layer menu. You should start with the model before any materials have been assigned. Create a new material and, in the Material manager, choose Texture > Texture Channels > Color. Use the dialogue box that opens to assign a new texture to the Colour channel. You'll be painting straight onto this texture later in *Photoshop* so make sure it's sufficiently large for the model. Now apply the material to the model. In the Material manager, add a new layer to the material and ensure that this layer is selected. The stroked UVs will be placed onto this layer later.

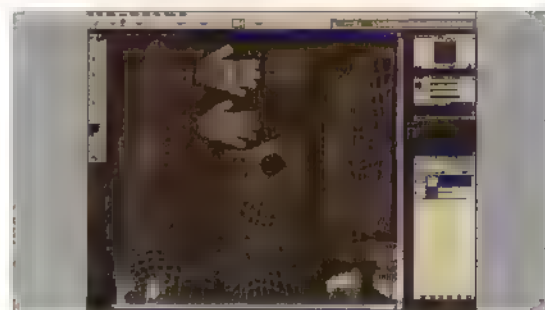
The Outline Polygons command will stroke the selected UVs using the current brush settings, so the next task is to set the Brush tool to the desired size, pressure and so on in the Attribute manager (in the Integrated version) or Active Tool manager (in the standalone version). For an outline that should be one pixel wide, set Size to 1. Also, set the Foreground colour to the desired colour for your strokes.

Next, select the model you want to paint. Choose Tools > UV Tools > UV Polygons, then Select Polygon > Select All to select all of the model's UVs. Outline the UVs by choosing Layer > Outline Polygons. Save the texture as a PSD file, load it into *Photoshop* and paint away. Now load the PSD file back into *BodyPaint 3D* and hide the UV mesh layer.

The beauty of this workflow is that if you need to tweak the texture, you can go back into *Photoshop* and switch on the layer for the UV mesh guide at any time. **[LS]**



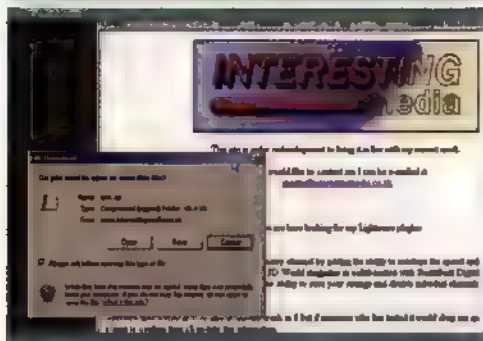
● The UVs selected in *BodyPaint 3D*. Use the Outline Polygons tool to stroke the selected UVs with the brush settings and foreground colour



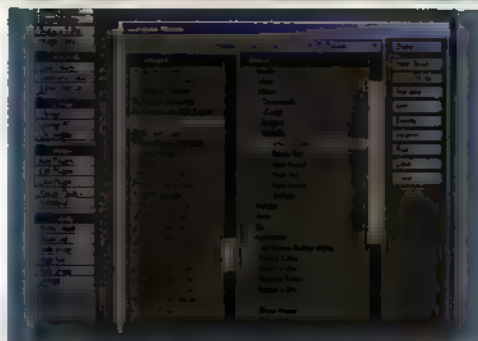
● Save the texture out as a PSD file and load it up in *Photoshop*. You're now ready to start painting, using the UV mesh layer as a guide

LIGHTWAVE | How can I speed up LightWave Layout when dealing with heavy scenes?

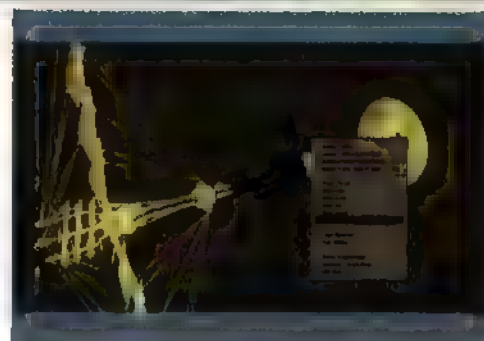
WELDEMAKER, VIA EMAIL



01 Download free plug-ins
Go to www.interestingmedia.co.uk and download *Solo*, a collection of six free LightWave plug-ins. These have been designed to add Modeler-like functionality to Layout so you can easily show and hide elements just by clicking a button, or pressing a keyboard shortcut. You'll need to unzip the file and place the six .lsc files in your LightWave plug-ins folder.



02 Add the plug-ins to LightWave
Open Layout and, from the Utilities tab, go to Add Plug-ins. Select all six scripts and click Open. Now, from the top menu group, go to Layout > Edit > Edit Menu Layout to bring up the Menu editor. In the left-hand panel (under Plug-ins) find Hide Sel, Hide Unsel, Hide Invert, Show Sel, Show Unsel and Unhide. Add these to a menu group on the right-hand side of the panel.



03 Use the new functions and features
You can now click the new buttons to show and hide whatever's selected or unselected, just like you can in Modeler. You can also go to Layout > Edit > Edit Keyboard Shortcuts to assign a useful shortcut to the Hide Selected plug-in. I used [Ctrl]+[H] so I could hide stuff exactly like I can in Maya, and [Ctrl]+[G] for Show Selected, so I can retrieve hidden items easily. [DS]

AFTER EFFECTS PRO 6.5 | Simulating Rack focus

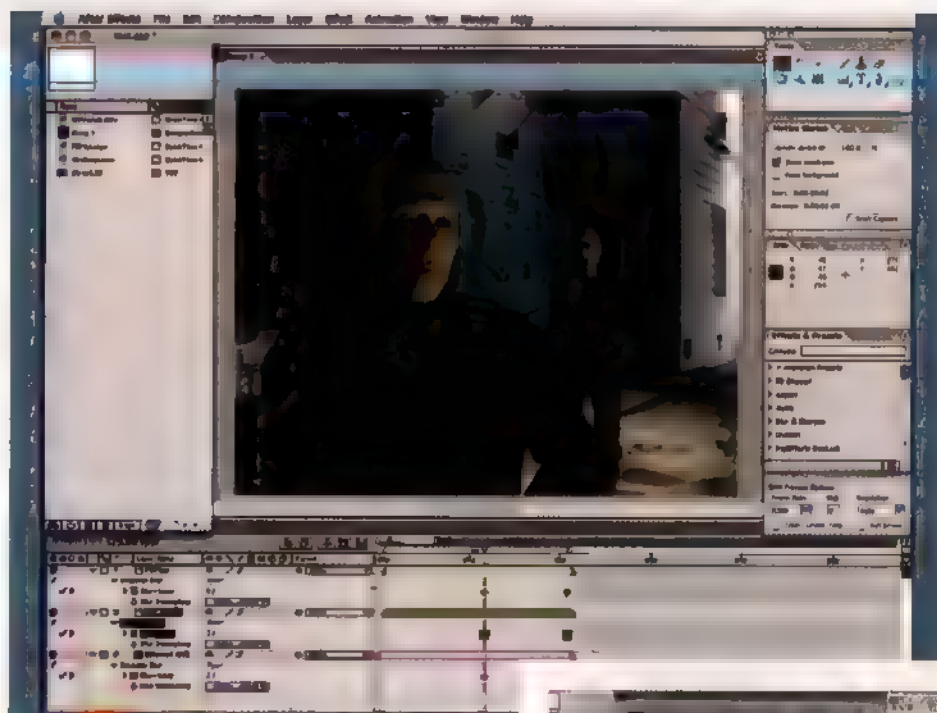
Q "I've rendered two characters and a background separately, but can I use After Effects to composite them with Rack focus blurring?"

DAVID CLARKE, VIA EMAIL

A Rack focus, sometimes called Pull focus, occurs when a cinematographer changes focus from the foreground to the background. It's used to direct attention within a shot and works best when there's some movement within the frame to guide your attention. In this example, the foreground character looks over his shoulder, guiding your attention to the background as it comes into focus.

After Effects is fully toed up with 3D Channel effects that enable you to simulate this focus effect through depth of field blurring. Unfortunately, arranging your layers and camera in Z-space can be time consuming, and getting realistic depth of field also takes time. You may find you have to do a lot of shifting and resizing of layers, and changes of camera settings, to get the look right. Although the power of After Effects' 3D tools shouldn't be underestimated, sometimes you need an easy way to achieve the same effect in minutes. Thankfully, the simplest method yields good results. This technique assumes that there's no major camera movement, and it uses Gaussian blur to simulate changes in lens settings.

Import the layers provided on the CD (FGman.mov, Street.tif, and BGWoman.mov) into After Effects. Move to a point just past halfway through the clips and apply a Gaussian blur to each layer. Set the FGman layer blurring to 0 and click the keyframe button. The BGWoman layer and Street layer should be set to a blurring of 2.0. Now move to the end of the footage and change the FGman layer's blurring to 6.0 and the BGWoman layer to 0. The Street layer should be reduced to 0.3. This keeps the wall just slightly blurred. There's nothing more to the technique, but you'll see that it creates a good simulation of a rack focus. [CK]



Q&A TIP

● To make the focus even more realistic, make it less even. Halfway through the focus shift, adjust the blurring down by a few tenths.

● The foreground is in focus for the first second, while the background is blurred. Keyframe, then go to the end of the clip

● At the end of the clip, crank up the foreground blurring and sharpen up the background. This makes the foreground slightly out of focus



POSER | Texturing individual parts of a model



"Is it possible to apply individual texture maps to parts of a model that has only one surface?"

KEVIN POWELL, VIA EMAIL



With each new version of *Poser* its capability to import other 3D file formats increases. *Poser 5* now enables you to import most of the popular formats, making it possible to add props to your scenes that were created in a wide range of other programs. However, depending on the format and complexity of the imported model, *Poser* may read all the polygons as a single surface, thereby making it seemingly impossible to apply individual textures to the model.

There's a way around this. By using the Group tool (located in the Tool menu), we can create individual groups within the prop. These new groups can then have individual textures or materials applied to them.

When you select the Group editor, the first thing you need to do is to click the New Group button and give your new group a name. The model will turn black. At the top of the palette, you'll

BY USING THE GROUP TOOL, WE CAN CREATE INDIVIDUAL PROPS

see two round buttons: one has a plus sign surrounded by a dashed rectangle and one has a minus sign. The plus sign is what you use to add the parts of the surface you wish to include in your group. The minus one removes areas, which is very handy if you accidentally select too many polygons.

With the Add button activated, click on (or drag over) the part of the model you wish to add to the group. The selected polygons are marked red. Move the camera around as you're working and move in close to make sure you're selecting the correct areas.

Once you have your area selected, click on the Assign Material button in the Group Editor palette. A dialogue box will appear, asking you to name the material. Now when you enter *Poser's* Material room, you'll find this new 'material' listed, ready for you to assign a texture. [JAW]

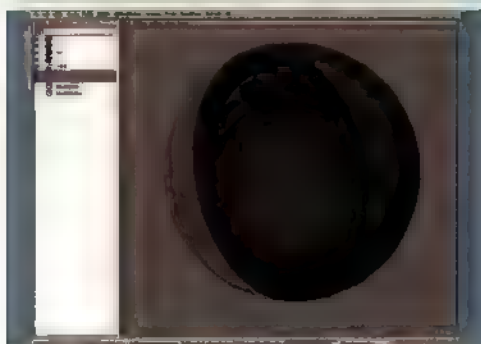


● Use the Group tool to select a smaller area of an imported model. The selected polygons will turn red.

● Once you have the area selected, you can work on the Material settings. You can also apply an image-based Texture map to your new group.



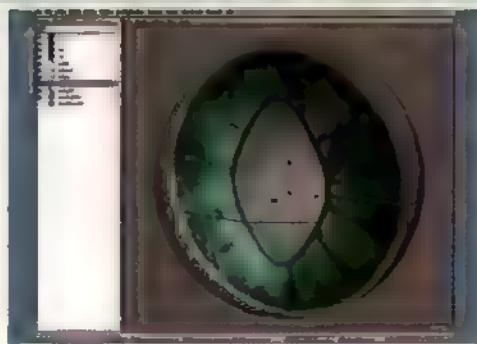
MAYA | How can I animate a pupil dilating, like the Puss in Boots character in Shrek 2?



01

Create the iris

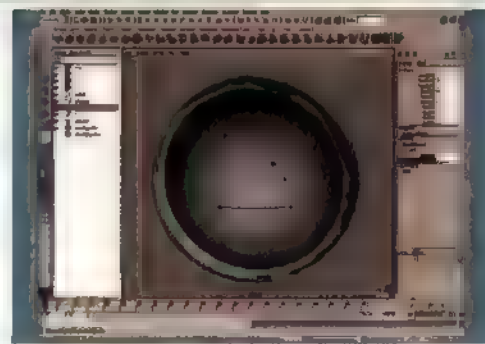
Cats have big irises, so create an eye with a large, transparent cornea and white back. Now select the front isoparm of the back of the eye and duplicate it with Edit Curves > Duplicate Surface Curves. Rename this 'IrisBase', scale it slightly and duplicate it, renaming the duplicate 'IrisRound'. Scale IrisBase to half its size. In the Modify menu, freeze both curves' transformations and centre their pivots.



02

Tweak and colour

If you look at the eye from the side view, you should see that the curves have scaled back towards the origin. Select the edge isoparm of the eye and then select IrisBase. Create a loft, calling it 'Iris'. Edit the shape of IrisBase using only CVs until it looks like a cat's iris. Finally, assign a colourful shader to the iris.



03

Shape the eye

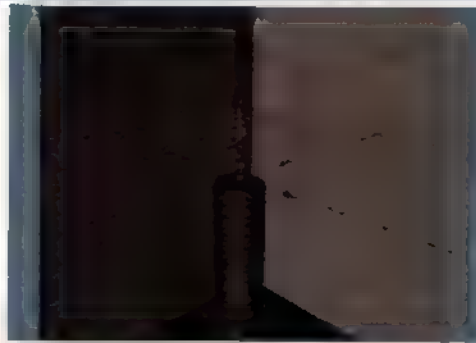
Now select IrisRound and [Shift]-select IrisBase. Go to Deform > Create Blendshape and, making sure you have the default settings set, click Apply. In your IrisBase objects, you should now have a node called blendShape1 with an attribute called IrisRound, with a value of 0. Animating the value between 0 and 1 changes the shape of IrisBase to the shape of IrisRound. [JAW]

CINEMA 4D | How do you animate believable candle flame movement?

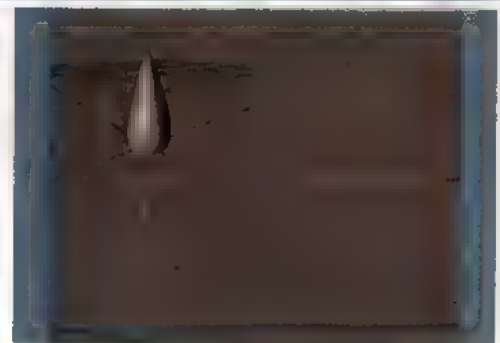
MATH, VIA EMAIL



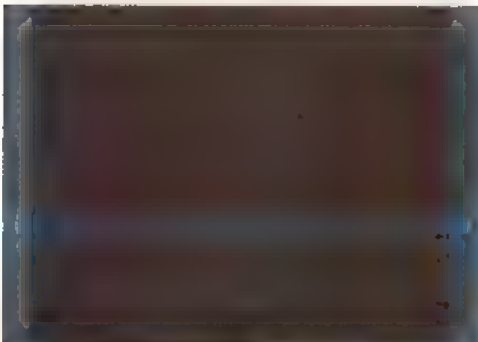
01 **Built-in shaders**
Cinema 4D has a built in Flame shader, which is often a nice solution when applied to a plane. However, the results often look too violent, and they don't always provide the kind of subtlety that you'd expect to get from candlelight.



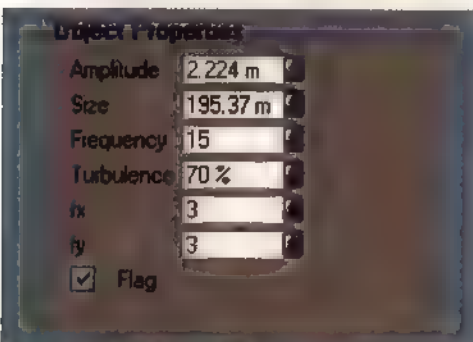
02 **Use the background**
Much of what makes a believable candle scene has nothing to do with the candle itself - the objects that the candle illuminates are just as important. Make sure you have walls or tabletops for the candle to light up. If you plan to use radiosity in your scene, make sure you give this high Illumination values.



03 **Use NURBS objects**
Creating actual rounded geometry will help you to create a believable flame. In this case, a simple Lathe NURBS object was created with a curve. This 3D shape also assists in good radiosity lighting. If you decide to use it for your candle.



04 **Edit the NURBS object**
Because you're going to use a deformation object to create the wave in this shape, it's important that there's enough geometry to allow for the deformation. Make the Lathe NURBS object editable, and use the Knife tool to create new subdivisions if needed. Make sure they're distributed vertically and evenly. As with the other Q&As in this section, the supporting scene file for this question can be found on the CD, along with full-sized screenshots for each of the walkthrough images.



05 **Use added information**
The secret to this technique is the built-in Wind Deformer. Although it's typically used with flags, it works well with flames too. Position it at the bottom of the flame and rotate it so that its X-axis is facing up. To get started, adjust the settings to match those above. Refine the Frequency, fx and fy on the Wind deformer to your taste.



Q&A

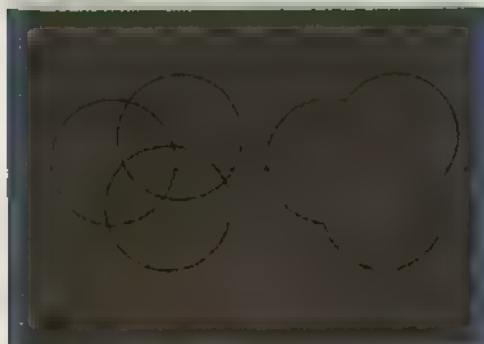
● An interesting alternative to this technique is to use NICKI from the plug-in JENNA. It can make the deformation more dynamic.

06 **Correct the flame's motion**
Make sure you do some quick previews to get a good look at the deformation. You'll want to get a little deformation to give the flame life, but not so much as to make it look mad and unrealistic. Once the motion's right, you can dive into the issue of selecting and using the right materials for your scene.

The sample file included on the CD contains some suggested materials that you could consider using in your scene, but make sure you adjust them to fit in with your own particular needs. If you're planning to use radiosity, make sure you use some good Luminance and take specific control of the Illumination channel for every material that you decide to use. [AW]

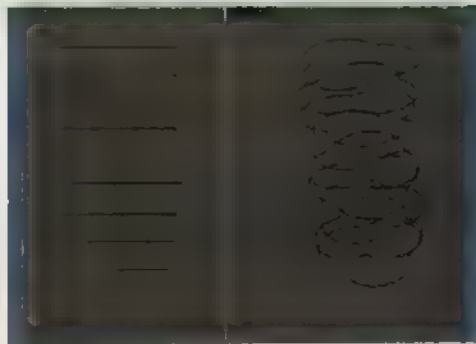
RHINOCEROS | How can I model realistic and fairly detailed rope?

SAM PEARSHOUSE, VIA EMAIL



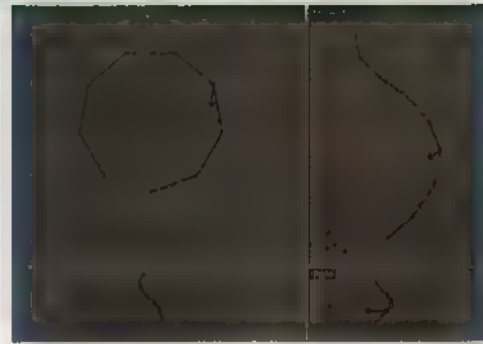
01 Create circles

Open up the 3dw_rope.3dm file from the CD and you'll notice three circles. The Polar Array tool was used to orient two duplicates of one circle around 360 degrees, using the World axis as the centre point. Using Trim, delete the inner parts of the circles, as shown in the screenshot above. Remember to join all the leftover curves into one because this will act as the profile for the rope.



02 Do the twist

Now duplicate the profile twice and move each of these duplicates down an equal distance from each other. Rotate the second profile 40 degrees and the third profile 80 degrees. Select all of the profiles and duplicate them twice. Now move them down again by an equal distance. All nine profiles should now act as a 40-degree twist of the profile, right up to 360 degrees.



03 Move the seams

Select all the profiles and use Loft. The lofting options will give you the opportunity to modify the curve seams. Unfortunately, these will need to be lined up manually. Move each seam so that it sits in the same place on each profile, as if the profiles were rotating round. Make sure the style is set to Normal and that the loft isn't closed. The final model can be unhidden in the file provided on the CD. [NR]

TRUESPACE | Fixing common errors with the Boolean tools



"The Boolean tools won't let me unite two adjacent objects, even though I've set the Identity figure to its minimum. What's happening here?"

ROB HENDLEY, VIA THE FORUMS



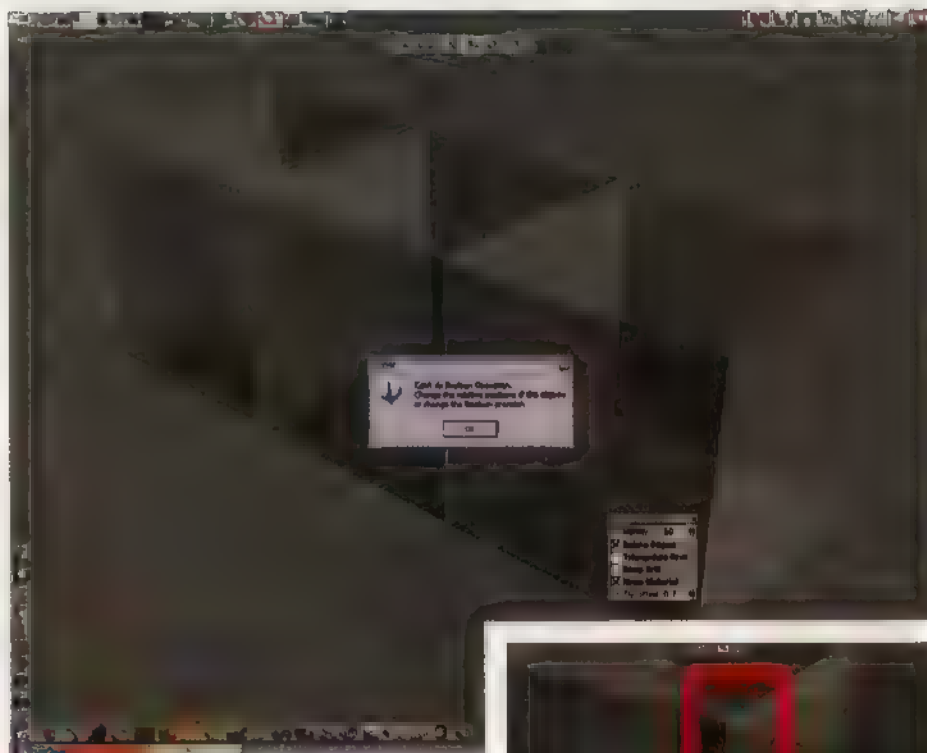
The Boolean tools in trueSpace are very powerful and effective but you need to use them with a little respect to avoid getting the dreaded error messages. In the instance shown here, the inner faces of the two cubes you're trying to join are sharing exactly the same co-ordinates. As soon as you try to union them, trueSpace abandons the Boolean process and produces a warning.

Fortunately, for simple objects like this, adjusting one or more of the faces may solve the problem. If you use the Bevel tool to add some geometry within the space occupied by the objects - thus moving the faces away from each other - and then repeat the operation, it'll be more successful. Keeping Delete Edges enabled in the Boolean panel removes the additional geometry after the successful union.

Before any Boolean operation, check the integrity of objects and use the Try to Fix Bad Geometry tool before repeating failed Booleans. This is important with meshes imported from other software and with versions of trueSpace before 5. The Solidify plug-in (available as a free download from Caligari) is invaluable for closing holes in meshes. Also, ensuring that all the Object's normals are correctly aligned can help avoid problems.

Another option is to reduce the identity of the Boolean operation. This will reduce the overall accuracy and is a compromise between accuracy and quality. In the Boolean Dialogue panel, use the slider to lower the value until the error messages no longer appear but the quality of the edges that are produced isn't compromised.

Try to avoid repeating failed Boolean operations. Also, rather than using the Undo tool, revert to a saved version of the scene before trying again. [AK]

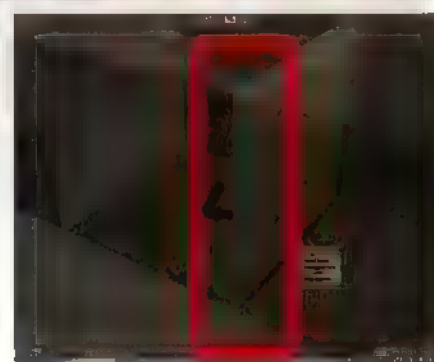


● The Boolean error message appears when trueSpace can't perform the operation that you've requested

Q&A

● Sometimes, just moving one of your objects a fraction will provide a quick workaround. Where 100% accuracy isn't critical, this is always worth considering.

● Adding geometry makes the Boolean operation more likely to succeed. Adjusting the Identity can also help



SOFTWARE XSI | Adding random motion to animations



"How do you add random motion and jiggling to an animation in order to enhance its realism?"

MYAMEE, FROM THE FORUMS



The first thing to be considered is the structure of the animation. If you apply the Judder directly to any of the object's axes, it'll be difficult to control or make changes to the general animation later on in the production. As such, the idea is to split the jiggling and overall motion into separate components so they can be controlled independently from one another. Granted, at first glance this might not appear as elegant as the use of expressions, but once you've set it up, you'll see just how much more straightforward and intuitive this approach will be.

Start off by opening your scene or using the Shaker scene from this issue's CD and then add a Primitive > Polygon Mesh > Cube (any polygon mesh will do). This object is where you'll be controlling the jitter, so give it a suitable name. Click Modify > Deform > Shape Jitter and click on the Lock icon in the Property editor to keep it open - you'll probably want to return to it later.

The Shape Jitter operator will randomise the position of each point of the mesh over time, based on the values you enter (suitable settings are shown in the scene file on the CD) and we'll use these to judder our main object. Select any of the points on the cube mesh and click [Ctrl]+[L] to create a cluster. Now select your main object and, from the Constrain menu, click Object to Cluster and pick the newly created cluster on the cube. Use the constraint compensation button, CnsComp, if you want to keep the main object's current position.

As you've just added a constraint to the shaker, it wouldn't make sense to animate the object directly. Instead, add a null object and use this for the overall transformation. With the null still selected, click on the Parent button, and with the left mouse button, pick both the shaker and the cube objects.

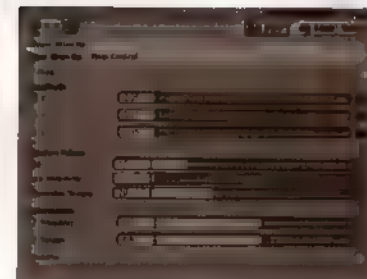
Due to the constraint, the shaker will now inherit the cluster's randomised position, as well as the null's overall motion, because of the parent-child relation. More importantly, they're controlled independently. With the hierarchy completed, you can select the cube and press [H] to hide it - you don't want it to show in the rendered images. [OM]



Q&A

While any animation will benefit from the use of motion blur, this is especially true for animations like this, so make sure you activate it in the Render options.

Splitting jitter and overall motion of an object like this shaker (the scene file is supplied on the CD) makes a real difference when managing your animation.



By using the Shape Jitter deformer, you automatically get a clean presentation with sliders for all the parameters needed, and you can animate them as well.

CONUNDRUM | Send us your solutions to this month's brainteaser

Each issue, we set you a real world 3D problem to solve. The sender of the best solution wins a selection of training resources. Last issue's conundrum was posed by Miriam Dobson, who wrote:

"How do I go about creating the rippled surface of a pond in LightWave? I'm trying to make use of ClothFX but I'm having trouble working out the settings."

Owing to an "unfortunate clerical error" (i.e. we pushed the wrong button on the forum and deleted the thread), our conundrum contributors this month remain anonymous. If you did post on the topic, please accept our apologies. However, from what we can remember of the solutions before they went to join the great electronic FAQ in the sky, they all involved the use of procedural displacement to create the ripples on the water surface. This was tried and rejected, by Miriam, who wanted to include a log floating on the surface of the pond, and therefore to control the way in which the ripples were deflected around it.

However, we did also contact our resident LightWave Q&A guru Ben Smith, who came up with the following solution to the problem: "Create a grid of polygons for the sea, and apply ClothFX to it. Make the log a collision object. Set Viscosity to 0, Resistance to about 0.5 and turn off Sub Structure with a setting of 0. It's

very much a case of tweak on an individual basis, though. It's also a good idea to make the collision object for the log a smart thin in the rendering log object to prevent nasty intersection problems."

In the light of the unusual circumstances surrounding the answer, we held a hasty stewards' enquiry and decided that we couldn't fairly award a prize for the issue. Normal service will be resumed this month, in the shape of the following problem:

THIS MONTH'S QUESTION

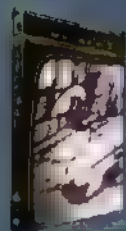
Our conundrum for issue 65 is posed by Cinema 4D R9 user Dimitrios Christou, who contacted 3D World to ask:

"I'm trying to animate blood flowing down a wall for a horror scene. How can I make it move realistically? I thought that using metaballs might solve the problem, but found the resulting scene almost impossible to animate. I don't have Thinking Particles and am now trying to make my standard emitters do the work."

As usual, you can post your suggested solutions on the appropriate threads in the Mag Related or Cinema 4D sections of our forum - and this time, we might actually have them up there long enough to collect the answers. Good luck, and have fun experimenting!



Controllable ripples on the surface of water can be created in LightWave using ClothFX. This screenshot shows the key settings required to create the effect.



Training resources on offer!

Post your solutions to the conundrum on our forum, and the one we think is best will earn its author a selection of 3D training resources...

Forum | Post your answers at <http://forum.3dworldmag.com>



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SPECIAL ALIAS LEARNING SUPPLEMENT



Made in Maya

Images (clockwise from top left) courtesy of:

Reel FX

Drive Comics

Home Studios

Sony Pictures Imageworks

Star Wars: The Force Awakens

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Mezco Toys



Something for Nothing



YOUR MOTHER probably told you years ago:
"There's nothing free worth having."

Or ... maybe you told her: "No, mom. You didn't really win a prize, don't click on that ... mom, NO!"

But that's not always true. (Hey, wasn't that the same day you found out there's some pretty decent free Spyware out there). So, in the spirit of learning – and because we like to see people using Maya to do cool stuff – we freely give you the following pages of Maya knowledge:

Facial Rigging tips & tricks from Erick Miller of Digital Domain, a **Maya Silver tutorial** that will help "arm" you for the future and a sample chapter from **The Art of Maya 3RD EDITION**.



Maya tips & tricks

Techniques and theory for hyper-real facial rigging



by Erick Miller

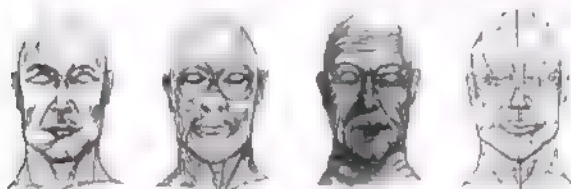
Lead Technical Director, Digital Domain

Images courtesy of Erick Miller, Paul Thuriot and Jeff Unay

The face has many unique challenges, and because of that fact, there is no golden solution to solve them all at once. Instead, each portion of the face must be analysed and broken down into a catered solution motivated by each unique problem. First we will start with model integrity, and move on to the idea and reasons behind combining these multiple rigging techniques into one single rig.

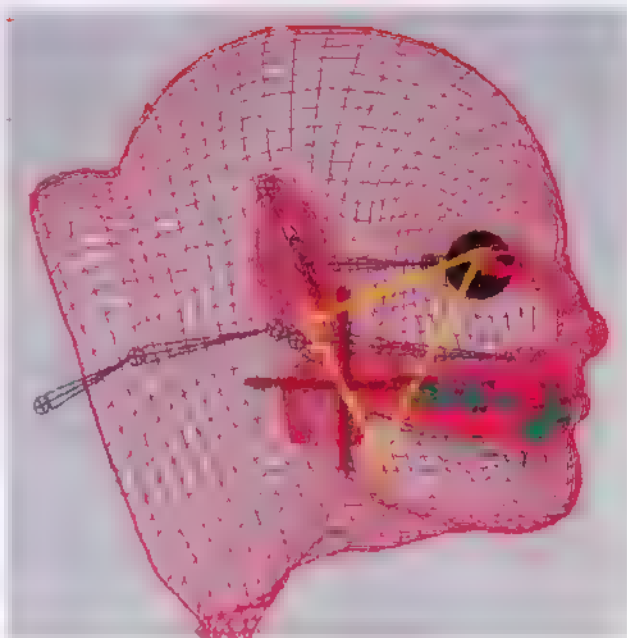
Model Deformation Integrity and Good Edge Flow

How the surface of the facial model is built is probably the single most important aspect to consider prior to, and during, the very first phase of the rigging process. This is true with character setup in general, but is particularly important with the head and face.



Examine the illustrations left to right. The first is a simple face illustrating basic shadow planes, next is the muscle structure beneath, the third exemplifies the coarse wrinkle lines of the face, and the last image shows the primary basic edge flow that your model can have based on the intersection between muscle lines and wrinkle lines. It is very important to notice that the fiber direction of muscles in the face run perpendicular and traverse to the direction of the wrinkle lines. Combining these two directions into your final polygon model is the goal.

First off, for modern facial rigging, a single mesh quad polygon control cage, optionally rendered as subdivision surfaces is the only way to go. I probably didn't need to tell you this, but for posterity, I thought I'd mention it anyway. For all sorts of painful reasons, patch models for facial rigging will only limit and prolong your rigging process, and are justifiably a thing of the past where complex facial animation setups are concerned.



Secondly, the model must have a really good wrinkle-line based edge flow in it's creation, with radial circular edge loops radiating from the eyes, mouth, nose holes, and ears, as seen in the diagram above.

Third, the model must have plenty of resolution to support the most complex range of base expressions. If you are not sure about how to gauge this, a good rule of thumb is to quickly model the face into a broad smile, a really wide-mouthed intense scream, and a really stretched open-mouthed surprised face. A lot of time you'll find you need to add a few extra rows of edges to the model at primary creasing points, primarily in the laugh lines, the upper nose, forehead and brow wrinkle lines, the crow wrinkle area around the eyes, as well as possibly the area under the lower lip and above the chin where frown lines occur. These are all hot spots to police for sufficient resolution. As you begin rigging your character, the need for extra resolution in these areas can sometimes make or break your ability to achieve the desired range of facial poses.

You can find more of Erick's teaching on facial rigging in the Maya Learning Tools DVD: *Maya Techniques | Hyper-Real Facial Rigging* one of three titles in the newly available Hyper-Real Series, which also includes *Maya Techniques | Hyper-Real Modeling* by Jeff Unay and *Maya Techniques | Hyper Real Body Rigging* by Paul Thuriot.

To learn more about Maya Learning Tools (or to purchase), please visit
www.alias.com/learningtools





IT IS VERY IMPORTANT to notice that the fiber direction of muscles in the face run perpendicular and traverse to the direction of the wrinkle lines. Combining these two directions into your final polygon model is the goal.



Silver Membership Tutorial

How to rig an arm with clean deformations

By Jakub Mares

Independent 3D Artist

One of the many things you need in order to obtain nice deformations in a character is a properly rigged arm with rotations that spread to the shoulder and twist (roll) bones. Such a setup removes linear deformations that collapse vertices between the two joints into unpleasant "candywrapper" shapes.

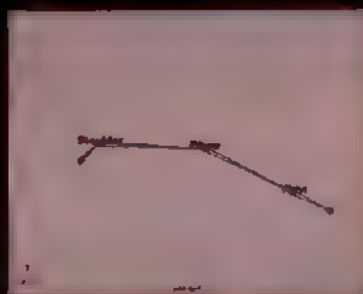
I have seen a lot of solutions to this problem using expressions, aim constraints, connections, etc., and I've found that they work to a certain degree; but, then you hit a brick wall with Euler rotations and gimbal lock. The first thing you find is that you can't use any kind of numerical connection since with Euler space, when you rotate more than 2 axis, you modify all rotation axis.

I've decided to try a slightly different method and allow Maya's *orient* constraint to do the dividing for me:

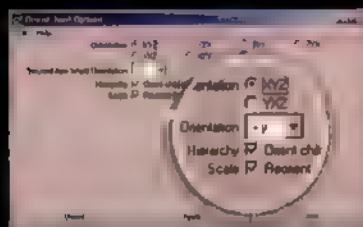
Elbow twist bones: The main idea behind this setup is to create three duplicate joints where one is constrained to two others, then rotate the two goal joints and constrain joint rotates to exactly half of the rotation.

Shoulder twist bones: Shoulder setup is slightly different as it's based on the idea that when you divide shoulder rotations in half, you probably won't run into Euler problems, plus, you can separate out the X rotation to twist the bone after you sum the other rotations in the hierarchy.

Step 1 Create basic arm and name joints: *Shoulder*, *Elbow*, and *Wrist*. [fig.1]



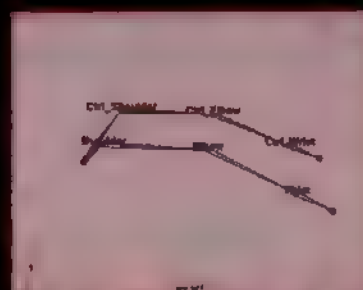
Step 2 Set the joint axis with the *Orient Joint* tool. [fig.2]



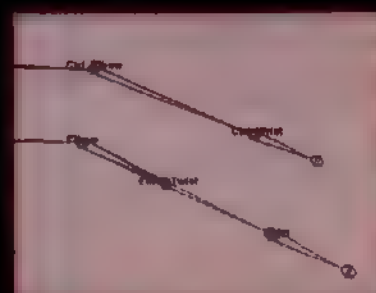
Step 3 Make sure that the *Wrist* and *Elbow* rotation axes are the same. [fig.3]



Step 4 Duplicate *Shoulder* and add Prefix hierarchy names. [fig.4]

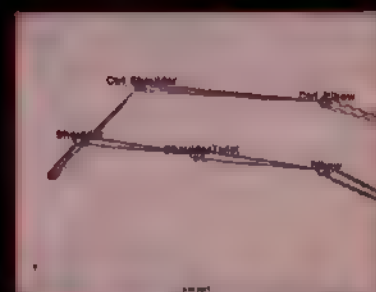


Step 5 Duplicate *Elbow*, move it in object coordinates halfway to *Wrist*, rename as *ElbowTwist*, parent to *Elbow* and delete duplicated child joints. [fig.5]

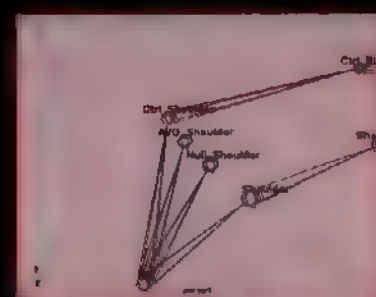


Step 6 Orient constraint *ElbowTwist* to *Elbow* and *Wrist*. In the Channel Box, break connections on *ElbowTwist* YZ. Now the *ElbowTwist* rotation is half the *Wrist* rotation.

Step 7 Duplicate *Shoulder*, move it in object coordinates halfway to *Elbow*, rename as *ShouldTwist*, parent to *Shoulder*, delete duplicated child joints and parent *Elbow* to *ElbowTwist*. [fig.6]



Step 8 Duplicate *Shoulder* and delete both of the duplicated child joints and rename as *Null_Shoulder* and *AVG_Shoulder*. [fig.7]



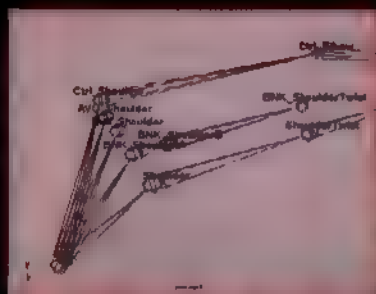
A sample of the online learning resources available to Maya Silver members

Step 9 Orient constraint AVG_Shoulder to Ctrl_Shoulder and Null_Shoulder.

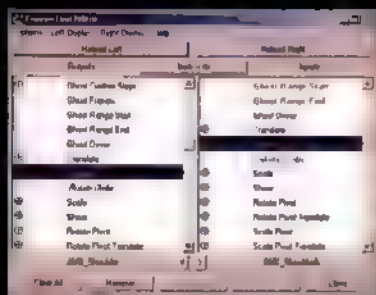
Step 10 Duplicate Shoulder and rename one copy BNK_ShoulderA and the second copy BNK_ShoulderB.

Step 11 Delete duplicated child joints from BNK_ShoulderA and parent BNK_ShoulderB to BNK_ShoulderA.

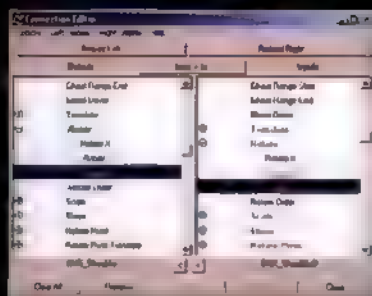
Step 12 Rename the Shoulder/Twist child of BNK_ShoulderB as BNK_ShoulderTwist. [fig.8]



Step 13 In the Connection Editor, connect the rotate attributes of AVG_Shoulder and BNK_ShoulderA. [fig.9]



Step 14 In the Connection Editor, connect the rotate YZ attributes of AVG_Shoulder and BNK_ShoulderB. [fig.10]

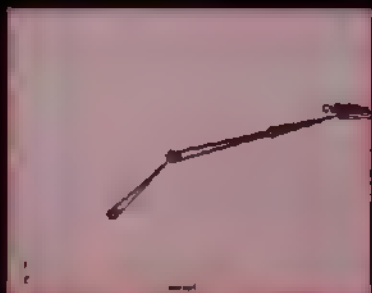


Step 15 In the Connection Editor, connect the rotate X attributes of AVG_Shoulder and BNK_ShoulderTwist. [fig.11]



Step 16 Orient constraint Shoulder to BNK_ShoulderB, ShouldTwist to BNK_ShoulderTwist, Elbow to Ctrl_Elbow, Wrist to Ctrl_Wrist.

Step 17 Select Ctrl_Shoulder, AVG_Shoulder, Null_Shoulder, BNK_ShoulderA, BNK_ShoulderB and point snap them to Shoulder. [fig.12]



Conclusion Now when you rotate the control arm, the rotation spreads correctly to the twist bones without any Euler rotation problems.

Get to where you're going

Whether you are a student, 3D hobbyist, or work professionally in the creative arts, Alias wants to make sure you are able to advance your skills. That's why we gave you the Maya Silver tutorial. It's why we have a free community-based, Maya Bronze website www.alias.com/bronze.

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An Introduction to 3D Computer Graphics

The Art of Maya 3RD EDITION is an introduction to 3D computer graphics unlike any other. Join the thousands of users who've garnered the knowledge they needed to enter the 3rd dimension with this full color visual exploration of the theory of Maya. Rich with diagrams and illustrations that demonstrate the critical concepts of 3D time and space, this book will help you understand the concepts critical to conveying your artistic vision through the medium of 3D. If you are an artist looking to incorporate 3D into your toolkit, this is the resource you need. The following is an excerpt from the book.

Modelling Techniques

Choosing the geometry type that best suits your model will depend on several factors, such as how the model is going to be used, how complex the model has to be, whether the model will be animated and deformed, and what kind of texture maps will be used. If you are unsure of what type of geometry to work with, it is possible to begin with NURBS because it can be converted to polygons or Subdivision Surfaces later. Polygons, however, cannot be converted to NURBS, but can be converted to Subdivision Surfaces.

Starting with Primitives

One of the most common ways to create a model is to begin with a primitive shape. This simple shape is then molded or expanded to add more detail. This technique using polygons is frequently used for developing environments and characters for interactive games. NURBS primitives, such as spheres and cylinders, are commonly used to begin organic modelling of objects such as body parts. A polygon cube is a good place to start a Subdivision model by simply converting it to a Subdivision Surface and then beginning to extrude.



Primitives

Primitives can be made of NURBS or polygons. All primitives have the option of having different spans and sections.

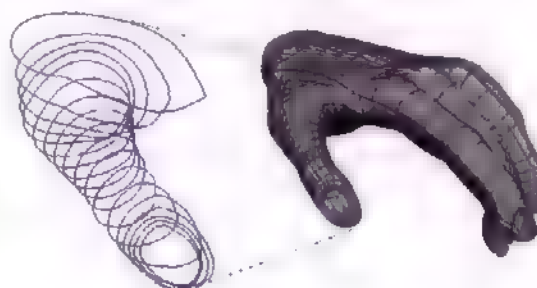


The model above was created from a NURBS primitive sphere that had several spans and sections in both directions to have sufficient detail. The Artisan Sculpt Surfaces Tool was used to create the main shape, which was then tweaked with CV manipulation. The model below began as a polygon cube. It was then scaled, had faces extruded, and was finally converted to a Subdivision Surface.



Network of Curves

For more precise surfaces, a network of curves can be used to control the shape and parameterisation of the surface. Surfaces can be created from curves, trim edges or isoparms. For industrial type of modelling, creating a network of curves is essential for smooth and precise surfaces. There are several tools within Maya to create a network, such as Snap to curves and Point Snapping, intersecting and projecting curves, Animated Snapshots, curve rebuilding, and surface curve duplication.



The thumb was created using a profile curve for the base, attached to a motion path. An Animated Snapshot was performed to create the curves to use for a Loft.

Symmetry

Most objects in life, whether they are organic or industrial, have symmetry. Modelling only half the object and mirroring it offers an efficient method for completing the entire object. This technique is widely used for industrial design, but can also be used for organic shapes such as heads and bodies. A helpful tip for viewing a mirrored copy update interactively while you work on one half, is to use an Instance duplication with a negative scaling instead of a regular copy.



Artisan Paint using reflection

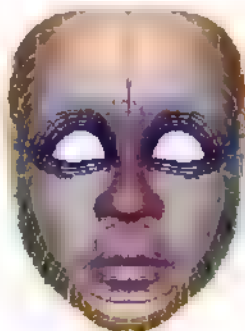
Mirroring half of head

The human head is one surface and not mirrored. Instead, it was created using the Artisan Paint Tool with the Reflection feature that sculpts on both halves at the same time. The alien head was modelled as one half and mirrored as a -1 scale in the X-axis.

Patch Surface Modelling

This method of modelling requires more planning than the others. This method creates a surface out of many smaller NURBS surfaces that have surface continuity and, typically, the same number and positioning of isoparms.

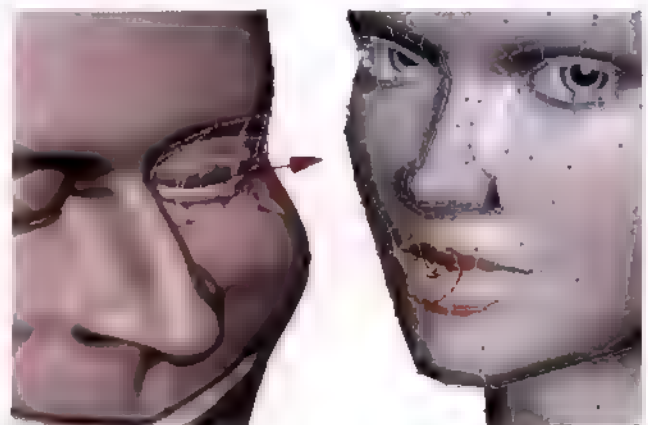
The planning stage of patch modelling involves deciding where the cut lines are to be positioned and what the parameterisation of the surfaces will be. The Stitch and Rebuild Surface Tools are used extensively to create surfaces with this method.



Organic Modelling

When the surfacing tools are not sufficient to create the shape you are looking for, direct control point manipulation sometimes is the only solution. Artisan is an excellent tool for creating broad shapes but it can be difficult to use in tight areas where you may need to manipulate only a few CVs or vertices at a time. Manipulating on such a fine level is an art in itself that demands patience and skill.

Selecting the points for manipulation can be the first challenge because it is easy to accidentally select points on the back of the model. Artisan paint Selection Tool can be handy for selecting or deselecting points since it works on the surface under the brush and does not affect points on the back surface. Also, being able to hide unselected CVs lets you focus on the surface without the clutter, making it easier to change your selection. On NURBS models, when hulls are on, they also offer good visual clues as to where the CVs are in space. After the selected CVs have been modified, use the keyboard arrows to pick-walk to the next row.



The left model displays only those CVs that are being modified. By pressing F, the view is focused to center on whatever is selected, making tumbling the camera easier for evaluation of the affected surfaces. The model on the right uses the Paint Selection Tool to select front surface vertices, avoiding wrong selections on the opposite side of the model.

Want to read more?

To purchase a copy of The Art of Maya 3RD EDITION visit
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Coming up | NEXT ISSUE

IN ISSUE #66

24TH OF MAY THE MAG BE WITH YOU

REVIEWS

HARDWARE / SOFTWARE / BUYERS' GUIDE



● On test this issue
(clockwise from middle):
Wacom Graphire3 Studio
XL A5, Nisus EASYPEN G6,
Wacom Intuos3 A4, Genius
Mousepen (Bx6), Trust
Wireless Scroll Tablet
1200-V2



Graphics tablets

GROUP TEST Create your graphics in the old-fashioned way using a tablet and pen. We take a look at five of the best solutions out there

BY MAT BROOMFIELD

Since the days of cave painting, there's been a direct link between the artist's hand and the drawing surface. Whether it was dipping a finger into wet earth, charging a quill into a pot of ink or drawing with felt tips, pencils and charcoal, creating an image works best when the drawing implement is applied directly to the canvas. Intuitive though a mouse may be it still has nothing on a

good old pen or pencil. The process of drawing using a mouse is a haphazard and imprecise activity. Graphics tablets attempt to re-establish the link between the hand and canvas by providing a flat surface onto which you can inscribe your strokes.

A graphics tablet is flat piece of plastic, with an embedded mesh of sensors. These detect the position and, in some cases, the angle of a special pen, which is used to draw directly onto the surface of the tablet. The pen's nib is used to transfer pressure to its internal electronics. Your software can be programmed to respond to varying

levels of pressure and, in most cases, more pressure means a thicker or heavier line is created. The greater the range of pressure sensitivity, the more subtle range of lines can be created. Some pens also have pressure-sensitive erasers, and there are a few pens that are also tilt-sensitive and can be used to create italics.

The finer the meshed sensors, the greater the resolution of the tablet, and thus the greater the level of detail you can create with it.

INTUITIVE THOUGH A MOUSE MAY BE, IT HAS NOTHING ON A GOOD OLD PEN OR PENCIL

Graphics tablets can also be used to control your computer: you can use a tablet mouse to move the cursor. Whereas a normal mouse can only operate in Relative mode (so there's no

relationship between the actual position of the mouse on your desk to the cursor on the screen), tablets offer a second option called Absolute mode. In this mode, the tablet's surface area is directly transposed to the screen, so the bottom left of the tablet is the bottom left of the screen, the middle of the tablet is the middle of the screen, and so on. With smaller tablets, this can provide a much faster form of navigation that some people prefer.

TALKING POINT | Why resolution matters

YOU MIGHT THINK It's obvious why you'd want high resolution - higher's better, right? But even the lowest tablet offers 1,000 lines per inch (lpi): it takes a light touch to draw at that level of precision. Where resolution matters is when your image is zoomed out a long way, say to 10 or even 25 per cent. Then, every inch on that tablet represents a greater amount of

image distance. A tiny hand movement may create a mark that's many times greater in size on the screen image. High resolution is one thing but, unless the tablet provides consistent recognition accuracy too, then the resolution may be wasted, especially if you're tracing an image. For ultimate precision, choose a tablet with a high level of accuracy as well as resolution.



DETAILS

PRICE
£69.99 / \$133* / €99.95

*Currency conversion
(All prices include VAT)

PLATFORM
PC

MAIN FEATURES
• 9x12 inch active area
• 3048 dpi resolution
• 512 levels of pressure sensitivity

MANUFACTURER
Trust

WEBSITE
www.trust.com



Wireless Scroll Tablet 1200-V2

If you need a highly affordable, no frills good-sized drawing tablet, the 1200-V2 may just be for you

DETAILS

PRICE
£99.99 / \$189* / €146*

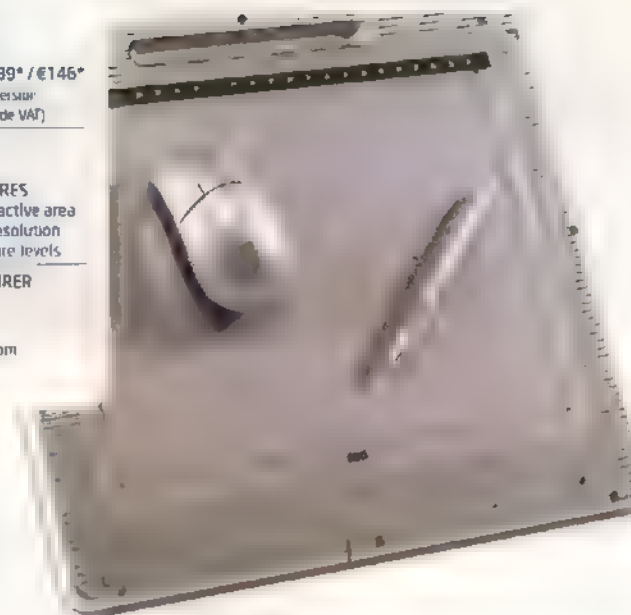
*Currency conversion
(All prices include VAT)

PLATFORM
PC

MAIN FEATURES
• 9x12 inch active area
• 3,048 dpi resolution
• 512 pressure levels

MANUFACTURER
Nisus

WEBSITE
www.nisus.com



EASYPEN G6

Extra software bundles enhance most products. But this time, the value is not so clear-cut



There are many levels on which an artist can use a graphics tablet. Like the Mousepen (see later), this tablet functions at the simplest end. It provides you with a means to create the basic shape of your images, and to do so using varying line weights, but little else. For the majority of users, this is more than sufficient. It enables you to create form, fill your images, add detail, and trace outlines. It lacks the convenience of an eraser, and the functionality of tilt sensitivity, used to create advanced stroke effects.

At 9x12 inches, it's slightly bigger than A4, enabling you to often work at 1:1 ratio when drawing. Furthermore, it includes a transparent overlay that can be used to hold pages for tracing.

It operates in both Absolute and Relative mode, and you can specify which to use using its drivers, which can be accessed via the control panel. The drivers also enable you to specify such features as the levels of pressure sensitivity. This one offers 512 levels compared to Intuos' and Mousepen's 1,024 levels. Even at 512 levels, we found it virtually impossible to create a great enough

variation in hand pressures to see more than perhaps a dozen or so different stroke weights. However, because the nib has quite a light spring mechanism, unlike the Mousepen, we found it easier to vary weights with this tablet.

If there's one thing that this tablet does lack though, it's the variety of control software found in the Mousepen. It comes with Corel Art Dabbler, the industry's de facto natural media art program, and of course it includes basic drivers, but nothing else.

The 1200 offers a decent surface area at an exceptional price. The absence of an eraser is probably its most serious flaw, while its generous 24 programmable macro buttons is a great bonus.

VERDICT

PROS

- Inexpensive
- Large number of macros
- Large active area

CONS

- No control software
- No eraser

RANGE OF FEATURES

6

VALUE FOR MONEY

8

OVERALL

5



The EASYPEN G6 uses exactly the same tablet as the Wireless Scroll Tablet 1200-V2.

At first glance the pen appears to have an eraser on top, which explains the additional £30 cost. Unfortunately, this is actually designed to hold the batteries against the connection points, and does nothing else. That means that the two tablets are functionally identical.

Nisus bundles a lite version of Corel Art Dabbler. Art Dabbler is a consumer-oriented version of the superb Painter program. So you get the same product with worse software for £30 more. Could there possibly be any saving grace from this? Well yes, but it provides very little comfort.

The tablet does include a few small pieces of software allowing you to use the tablet in non-artistic environments. The most useful of these is the handwriting recognition and annotation package, which enables users to write using the pen instead of the keyboard, and allows you to place special sticky memos on your Word documents. It might be handy, but the software is about nine

years old, so it's far from cutting edge.

So, to the tablet's positive points: it shares the same high 3,048 lines per inch resolution as the Wireless Scroll Tablet 1200-V2 and has the same 512-level pressure sensitivity on the pen nib. It offers a greater-than-A4 surface area with a transparent overlay for tracing. That means that, for about the most advanced of artistic use, it's perfectly suitable, although the surprise lack of an eraser is a tad inconvenient.

The tablet offers 24 macro buttons, some of which are already programmed, and all of which can be reconfigured.

Although the EASYPEN G6 is a competent tablet, it has a horrible mouse, and a worse pen than its cheaper rivals.

VERDICT

PROS

- Good maximum read height
- High resolution

CONS

- More expensive than its superior rivals
- No eraser

RANGE OF FEATURES

4

VALUE FOR MONEY

5

OVERALL

4

DETAILS

PRICE
£344* / \$647* / €499

*Currency conversion
(All prices include VAT)

PLATFORM
PC / Mac

MAIN FEATURES

- Tilt-sensitive pen with eraser
- Very high resolution and tracking speed
- Very ergonomic

MANUFACTURER
Wacom

WEBSITE
www.wacom.com



Intuos3 A4

Everyone knows that Wacom does the best graphics tablets. But are they the best value for money?



Wacom has been the number one player in graphics tablets for as long as we can remember

but, looking at the company's flagship product - the Intuos3, it's not without its weaknesses.

It's an A4 tablet with an active area measuring 30.5x23.1cm but, unlike most of its rivals, it has no transparent overlay for tracing images. Nor does it have macro buttons directly on the tablet area.

Instead, it has two sets of four quick keys - one set at either side of the tablet, for left or right-handed operation. These can be programmed to serve whatever functions you require. Nevertheless, compared to the competition (which offers 24 and, in some cases 29 macro buttons), four seems somewhat lacking. The tablet does have an additional feature called a touch strip, and this can be used to zoom within your applications.

What makes the tablet so special are the specifications of its pen, and the way it interacts with the tablet. It doesn't use a battery and is the only one in the round-up to include tilt sensitivity, enabling the most artistic of users to achieve greater expressiveness while drawing. You can

also buy other pens, including an airbrush, which more closely simulates the feel and behaviour of real drawing and painting tools. At 5,000 lpi, it has the highest resolution tablet in our round-up, allowing you to work on high-resolution images without magnification. Whether anyone has sufficiently fine motor controls to take advantage of this is questionable.

With a fast report rate (enabling quick hand movements), and a high degree of accuracy, this is the ultimate tablet for serious artists. It also has the most ergonomic pen of them all, but all of this functionality comes at a very high cost. Although Intuos3 usually performs well when it comes to graphics tablets, there's still room for improvement.

VERDICT

PROS

- Advanced pen features
- Highly responsive and accurate

CONS

- Very expensive
- No tracing overlay
- Limited macros

RANGE OF FEATURES	7
VALUE FOR MONEY	5
OVERALL	5

DETAILS

PRICE
£164* / \$308* / €299

*Currency conversion
(All prices include VAT)

PLATFORM
PC / Mac

MAIN FEATURES

- 20.9x15.1cm
- one pen with eraser
- 2,032 lpi resolution

MANUFACTURER

Trust

WEBSITE



Grafire3 Studio XL A5

Created for consumers rather than pros, the Grafire3 aims to provide users with affordable excellence



The Grafire3 is the cheapest tablet in our round-up to include a functional pen eraser.

For about £150 you can get the same package without the software bundle, but it's still over twice as expensive as the Trust 1200 - a tablet that, in a number of ways, offers superior performance. It's a mark of how important to your workflow we consider an eraser to be, that we almost made this the group winner just on that basis. However, ultimately, there were just too many negatives to let it take the 'winner's prize'.

Its A5 (20.9x15.1cm) area is not that much better than the Mousepens, yet it lacks any of the macro buttons that its rival provides. Instead, it enables you to define pop-up menu items, and the menu can be assigned to any of the mouse buttons. This is not quite so immediate, but it's better than nothing.

The tablet is covered with a thick plastic photo frame, under which you can place templates for tracing. At first look, the heavy-duty plastic seems preferable to the acetate sheets covering the EASYPEN and the 1200. But then you realise that

the plastic's soft texture can actually cause parallax problems, as the light is distorted by varying amounts according to your viewing angle. The effect is minute but, if you're seeking absolute precision, it might make a difference.

The other factor that put us off was the fact that, when you remove the plastic photo frame to achieve a closer, more precise drawing surface, the underlying blue pad provides no indication of where the active area starts or finishes.

At 2,032 lpi, the tablet has the second-lowest resolution, a bit more than enough for most artistic tasks. The Grafire3 could have been a winner but there are enough limitations at the price for it to miss out on the ribbon.

VERDICT

PROS

- Ergonomic pen
- Comprehensive software bundle

CONS

- Expensive
- Thick photo overlay

RANGE OF FEATURES	7
VALUE FOR MONEY	6
OVERALL	7



THIS ISSUE'S WINNER

Mousepen (8x6)

If you're a bit strapped for cash and are looking for a replacement mouse that has all the essentials for a decent introduction to graphics tablets, this budget-priced product is ideal

DETAILS

PRICE

• £33.93 / \$64* / €49*

*Currency conversion
(All prices include VAT)

PLATFORM

PC

MINIMUM SYSTEM

- Pentium
- 64MB RAM
- 4MB HD

MAIN FEATURES

- 8x6 inch active area
- 1,000 lpi resolution
- 1024 levels of pressure sensitivity
- three-button pen
- Wheel mouse
- 29 programmable macro buttons
- Gesture recognition
- Handwriting recognition

MANUFACTURER

Genius

WEBSITE

www.geniusnet.co.uk

SUPPLIER

CCL Computers

SUPPLIER'S WEB

www.cclonline.com



Some tablet devices are intended as digital art tools, while others are designed as mouse

alternatives – this is one of the latter. The tablet measures just 8x6 inches, which is small enough for you to move across its entire area without reaching too much, yet large enough for you to create fine details when drawing.

With a resolution of just 1,000 lpi, we expected this to be unusable as an art tool, but were surprised to discover that even at high screen resolutions, it was able to provide a good level of precision.

It only operates in Absolute mode, which can be a pain, especially as Relative mode is one method of compensating for a low tablet resolution. Relative mode is also the preferred method of using a mouse and, as this system includes one, it would have been a nice idea, and easy to accomplish. However, its Absolute mode comes into its own when you use the system to control your Windows applications, enabling you to navigate the screen instantly and with confidence.

Two things make this tablet really useful as a control device: its considerable number of macro buttons, all of which can be programmed to your own specifications.

There are 13 pre-programmed buttons, set for functions such as cut, copy, email, undo, and so on – all of which can be easily reconfigured for your needs.

The second thing that makes the tablet really useful is a system of stroke recognition called Pen Commander. Once

default, it are configured to emulate the mouse buttons. But, as with everything else, these can be re-assigned to perform alternate functions.

For the price, this is an excellent introduction to the world of graphics tablets. You get the essentials and, when

EVEN AT HIGH RESOLUTIONS, THE MOUSEPEN IS ABLE TO PROVIDE A GOOD LEVEL OF PRECISION

activated, if you draw a preset shape on the screen (usually shapes that are unlikely to occur during everyday screen navigation), pre-programmed tasks will be performed. These will usually be operations such as launching or closing an application, but you can add your own more advanced tasks.

As an artistic tool, the Mousepen is fine for drawing shapes, and its 1,024 levels of pressure sensitivity is greater than most. But without an eraser or tilt sensitivity, it's not as valuable as it could be. The default pen setting requires more pressure on the nib than I personally find comfortable, but the unit's pressure response can be customised. There are two buttons on the pen barrel that, by

you require more, you can buy something more powerful later. It's a shame that we happen to select the cheapest priced item in a group test as a winner, but you seem to lose so little functionality for the price that it deserved the winner's accolade.

VERDICT

PROS

- Inexpensive
- Excellent control software
- Loads of macros

CONS

- No eraser
- Low resolution

RANGE OF FEATURES


7

VALUE FOR MONEY

10

OVERALL

8



WITH THE MOUSEPEN YOU GET THE BENEFITS OF A GRAPHICS TABLET, AND SOME INNOVATIVE COMPUTER CONTROL SOFTWARE ALL FOR A KNOCK-DOWN PRICE

CONCLUSION | Which tablet will suit you?

It's always difficult to decide the winner in the group test but, this issue, we hoped it would be easier because there are relatively few criteria by which to judge the tablets – and, in general, those that perform well in one area, perform well in the others too. Unfortunately, this was quite a negative test to determine the winner, because all of the tablets were stumped by at least one major shortfall.

With the Wacom tablets it was the price and the lack of markings, with the other three the lack of an eraser was a serious ergonomic irritation, and there were other limitations too.

Although bundled applications such as *Art Dabbler* and *Photoshop Elements* were mild considerations, we reviewed on the assumption that you'd be buying a tablet to improve the way you interact with software you already own. That meant that valuable control software, such as that

which is supplied with the Mousepen, is of more interest to you than bundled art applications.

It's clear that you pay a disproportionately high cost for features such as erasers and tilt sensitivity. We took this into consideration, penalising what we considered to be inflated charging.

Most tablets, except the Mousepen, seem to be involved in a pressure sensitivity and resolution race. Admittedly high resolution does offer benefits, especially at smaller tablet sizes, but it's questionable whether you have the fine motor control in your hand to take advantage of 5,080 lpi of resolution, let alone 1,024 levels of pressure sensitivity!

The Intuos3 is undoubtedly the most responsive tablet with the greatest ability to detect and interpret subtlety in the movements of an artist. If you're an accomplished artist seeking to achieve a digital art experience that's as close as possible to real-world media, then it's your only choice. The

combination of a multi-pressure eraser and a tilt-sensitive pen makes it unique.

We had expected the Grafi3 would provide a good compromise, offering most of the subtlety of Intuos combined with the affordability of the other tablets. Instead, it fell into a no-man's land, being more expensive than the less specified tablets, yet lacking the size, macro buttons or eraser that would have elevated it high above the competition.

While the EASYPEN and the 1200 V2 were both competent, neither were particularly good mouse substitutes, and that left only one other contender: the Mousepen. It lacks the resolution, size and relative mode of the others, but it's so inexpensive that these didn't count too hard against it. You get the essential benefits of a graphics tablet, and some really innovative computer control software all for a knock-down price. ●

VITAL STATISTICS

MODEL	ACTIVE AREA	RESOLUTION	PRESSURE	MAX READ	TIPT	ERASER	NUMBER OF	INCLUDES	MARKER	OVERLAY	ABSOLUTE	OTHER	PRICE	SCORE
EASYPEN 08	9x 2"	1,400lpi	5 levels	4mm	No	No	3	Yes	24	Yes	yes/yes	2x9" 3x6"	£99.99 inc	4
1200 V2 Wireless small tablet	3x 2"	4,096lpi	5 levels	4mm	No	No	1	Yes	14	Yes	Yes/Yes	B&B 6x4.5" 1x	£63.99 inc	5
Intuos3 A4	9x 2"	4,096lpi	1,024 levels	4mm	Yes (100% pressure)	Yes	4	Yes	8	No	Yes/Yes	A4 A6	£344 inc	5
Grafi3 Studio XL A5	8x6"	0.002lpi	5 levels	4mm	No	Yes	1	Yes	1	Yes (heavy duty)	Yes/Yes	A5	£500 inc	7
Mousepen	2x6"	4,096lpi	4 levels	3mm	No	No	3	Yes	29	Yes	Yes/Yes	Not in UK	£1193 inc	8



DETAILS

PRICE
£157 / \$249 / €229

PLATFORM
PC / Mac

MINIMUM SYSTEM

- Windows 2000 / XP
- 500MHz Pentium processor
- 256MB RAM
- 500MB HD
- Mac
- Mac OS X 10.2
- 500MHz G3 processor
- 256MB RAM
- 500MB HD

MAIN FEATURES

- Figure posing and animation package
- Includes extensive library of figures, hair, poses, props, and lights
- Many single-click light rigs including magic lights

DEVELOPER
Curious Labs

WEBSITE
www.curiouslabs.com

Poser 6

No other program makes it easier or quicker to pose and animate figures, but how has the latest version of Poser improved the product line?

BY MAT BROOMFIELD



Poser is a program with a chequered past, but one with two consistent – and opposing – threads running through its development. Firstly, it's one of the most empowering 3D programs to use, and secondly, with every release, obvious (and much-requested) design improvements have been omitted – presumably because they were too costly or time-consuming to implement. The latest version is no different.

Poser 6 includes a huge amount of new content that, were you to buy online, would probably cost three or four times as much as the program on its own. The new figures offer a wider range of facial expressions than just about any others we've seen, allowing you to more closely mimic human expression. In particular, the lips and tongue are far more mobile, enabling you to create poses in which the lips overlap each other more accurately. There is also a really useful option that randomises the numerous parameters at the click of a button to produce really original expressions.

It's also exciting to see such a generous wardrobe of clothes for the new figures, as this will enable you to use them in many situations straight out of the box. But less welcome is the fact that the new figures seem rather light on morph targets. In general, most body parts have been reduced to three body type morphs: endomorph, ectomorph, and mesomorph (fat, thin,



● No other pre-built figures have ever had faces as expressive as the ones included with Poser 6

and muscular) with none of the fine tuning that made the DAZ figures – previously the *de facto* standards for Poser – so versatile (and consequently so memory intensive).

LEANER AND MEANER

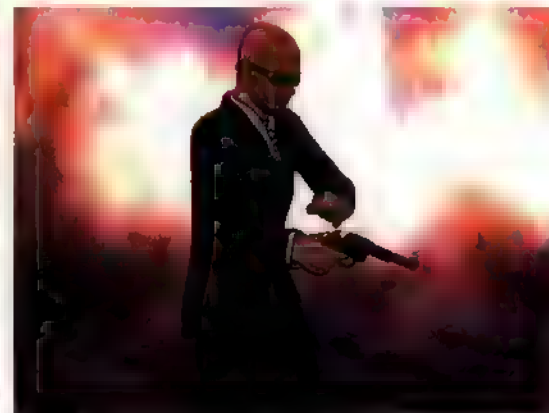
Poser 6 provides a better workflow and more rendering capabilities than its predecessor, including a one-click set up for the complex FireFly raytracing engine. What it doesn't provide is new modelling or shaping tools. We've long wanted to see easier ways

to create morphs within the program so that users can quickly create their own body shapes, but sadly the lamentable Magnet tool is still your main option.

Because of the nature of the enhancements to this version, it feels initially like a maintenance upgrade rather than a major step forward in character technology. Most of the enhancements will be of greatest benefit to existing users who have grown to know (and feel impeded by) the current workflow. For example, when



● Ambient occlusion might be extremely processor-intensive to render, but it does produce much softer shadows in your scenes



● The Toon shader enables you to create comic-style renders, but a single-click Toon All button would have greatly simplified the process

RELATED PRODUCTS

Poser 5
Reviewed: issue 31
• May 2004
Reviewed: issue 44



● In Poser 6, you can now store multiple renders for later viewing within the program and, using the Renderwipe feature, you can also compare the images in Split-screen mode

you used to render the same image many times, Poser used to reload the textures and regenerate the Shadow maps every single time. Now you can optionally leave textures loaded and re-use Shadow maps. Another rendering time saver is the long-overdue area render which enables you to render a small part of the screen.

You can also specify the maximum texture size, so the program will dynamically downsize large textures at render time allowing you to use a single high-res texture at any camera distance. However, this can only be set globally so you can't specify a high-res texture for characters near to the camera, and a smaller one for characters further away in the scene.

The program now supports OpenGL, which ought to provide faster, smoother feedback but, despite assurances that it would rock our world, we didn't see much change on our 3.2GHz Pentium 4. Furthermore, because of the way the characters are created, the speed bottleneck is still the type of figure geometry, not the preview rendering technology – figures with lots of bends (humans and animals) will keep the refresh rate slow because it is the CPU, and not the display mode, that limits the screen's update speed.

LIGHT AND SHADE

There are several new lighting modes, including Image-based lighting (where an image is used as a light source), and ambient

occlusion. You can think of ambient occlusion as 'radiosity lite' – which is to say that it calculates the degree to which other objects in a scene occlude the ambient light to a given point on a surface, producing far softer and more natural looking shadows. There's also a new point light mode, enabling you to position a light source within a scene so you can now create light bulbs, space ship exhausts, flashlights, and so on.

The Material Room now has a Simple mode similar to Poser 4's material editor,

THE PROGRAM HAS BECOME LEANER AND MORE STABLE IN SOME – BUT NOT ALL – AREAS

which allows beginners to quickly add materials without getting overwhelmed by the considerable power (and complexity) of the full node-based material editor. This is still available for advanced users, however, and there are now additional buttons with which you can quickly apply effects such as the Toon shader, which you can use to create cartoon-style renders. There's also a new Toon Outline mode, which adds even more power.

However, one considerable irritation is the fact that the program still only has a single level undo. Worse still, you can't even undo every operation so, if you accidentally delete a figure, it's gone, whereas if you change a pose then move a camera to view the new pose from a different angle, the camera move takes up your undo, so you're stuck with the pose anyway.



● The area render feature in Poser 6 allows you to render only the part of the screen that you want to see – a huge time-saver, and a feature that has long been overdue in the software

As with Poser 5, the enhancements in version 6 are quite technical and many are far from immediately obvious. However, as you become familiar with their benefits, you'll realise that the program has become leaner and more stable in some – but by no means all – areas.

In the past, saves were prohibitively slow and file sizes excessively large, acting as a disincentive to regular saving. Now provided your figures have been added to the Poser 6 library, scenes that may formerly have required 30,500MB of space

can be saved in just a few hundred kilobytes. The only problem is it does mean manually converting all your

figures, props, and clothes to the new format to achieve maximum benefit.

THE BOTTOM LINE

Overall, Poser 6 effortlessly shrugs off competition from the hugely overdue DAZ|Studio, standing head, shoulders, and nicely posed torso above its only true rival. However, as usual, many obvious and valuable enhancements have been omitted. Furthermore, there are still many bugs, as if the program has been released to a time schedule, rather than a quality standard. The renderer is still not particularly stable, and often leaves you wondering whether it's crashed or is simply excruciatingly slow.

Poser 6 is currently the only serious choice in this market sector, and we heartily recommend it, but it still has the potential to be much better. ●



● This simplified Options dialogue is one of many rendering optimisations. Choose render quality, and Poser creates the correct settings



● New to Poser 6 is the Content Paradise: a well designed one-stop portal to much of the best free and commercial content on the web

VERDICT

PROS

- Inspirational to use
- Extremely good value
- Generous amount of new content

CONS

- Abysmal undo
- Unstable

RANGE OF FEATURES

9

VALUE FOR MONEY

10

OVERALL

8



DETAILS

PRICE

• £850 / \$995 / €764*

* Currency conversion
(All prices exclude VAT)

PLATFORM

PC / Mac

MINIMUM SYSTEM

PC

• Windows XP / 2000

• Pentium III 850MHz

• 512MB RAM

Mac

• Mac OS X 10.2

• G4 800MHz

• 512MB RAM

MAIN FEATURES

• Diamond layer

• Timewarp

• Gbuffer builder

• Interface enhancements

DEVELOPER

Autodesk

WEBSITE

www.discreet.com

● Due to unforeseen circumstances, this review was carried out using a final Beta version of *combustion* 4. The final version's features may differ slightly, so check with the manufacturer

RELATED PRODUCTS

• After Effects 6

Reviewed: Issue 47

• DFX 4.02

Reviewed: Issue 43

combustion 4

This heavyweight compositing package is aimed squarely at the 3D market, but will this latest version have After Effects running scared?

BY CHRISTIAN DARKIN



combustion entered the desktop compositing market as a heavyweight. Coming from the same

stable as industry-standard effects tools *flint*, *flame* and *inferno*, it brought a clean, simple interface and a set of professional features to the PC and Mac. The program's major competitor, *After Effects*, now has much to fear because *combustion* is a fast, efficient system with an interface that never looks cluttered - unlike its main rival.

A large, configurable monitor covers the top half of *combustion*'s screen, offering quickly fast playback of your effect at full resolution and with excellent RAM previews. You can easily switch to view only part of the workflow or open up more monitors to view different aspects of your shot.

A schematic view is also available, which enables you to see exactly how each effect and media clip is integrated into the final shot. On the bottom half of the screen, all the menus, buttons, and controls you need to produce and keyframe your effects are organised into tabs. The key to using *combustion* is in realising where everything is hidden, so while the package is tricky to master at first, it's fast to work with once you've got it under control.



● *combustion*'s layout is customisable, but the large monitor at the top of the screen combined with the effect controls at the bottom mean that it rarely gets messy, unlike rival *After Effects*

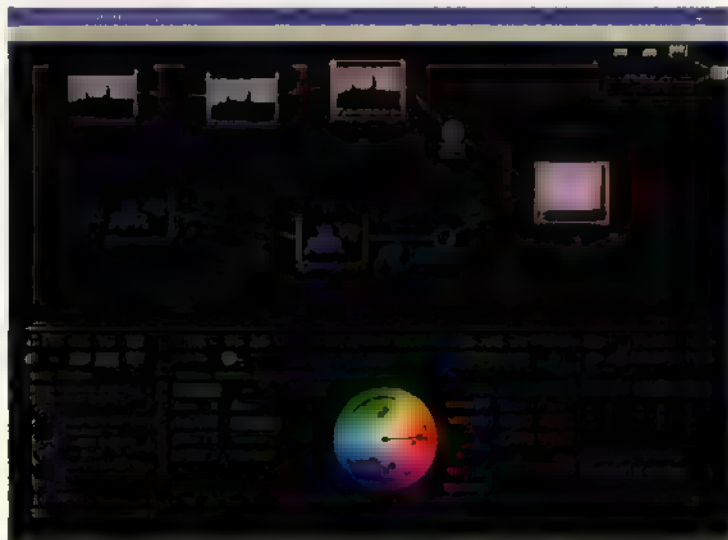
While *After Effects* has been busy integrating itself with video editing packages, 2D image creation tools and DVD authoring programs (namely *Premiere*, *Photoshop*, *Illustrator* and *Encore*), *combustion* has been concentrating more on 3D, offering the ability to import far more than just RGB and alpha channels. In fact, with Autodesk's RPF files, you can

endure out in *3ds max* and import depth mattes, object transparency, normal information and even speed of movement into *combustion*. This means you can add depth of field effects, alter lighting and even change rendered effects on a completed render. Autodesk has stopped short of including the ability to import true 3D objects or *max* materials, although *combustion* does enable you to place light and shoot video layers in true 3D space, and you can now import *max*'s target cameras.

Connectivity works the other way too, with *max* accepting *combustion* projects as maps that can be used for textures (or bumps, reflections, opacity backgrounds, or indeed anything else you can use a map for in *max*). Again, full export of *combustion* projects as *max* scenes isn't possible, although it would have been useful.

combustion has all the basic tools a compositor might need: keying, tracking, masking, colour correction, 3D compositing and keyframing of effects are all well organised, and powerful. As most of them come from top-end effects suites such as *flame*, that's hardly surprising.

However, there are also some head-grabbing effects, such as powerful warping and morphing, as well as a particle system



● *combustion* offers a range of views, enabling you to focus in on specific areas of your workflow. The Flowchart view (shown above) provides an instant look at the way your effect is constructed



● This latest version of *combustion* enables you to automate any animated property just by dropping in a pre-written expression. These produce repeating, continuous or random effects

(straight from the standalone package *particleillusion*), which offers a range of presets for any effect, from pyrotechnics to waterfalls. The results are both impressive and instant, and highly configurable.

Basic editing is included in the package. We're talking *Windows Movie Maker* rather than *Avid* here, but there's enough functionality to trim the in and out points, cut clips together and introduce mixes. These tools aren't meant to compete with your editing package – they're included so you can add filters or masks to a whole sequence of shots while still being able to change the edits, or place effects on individual clips in the sequence.

WITH DIAMONDS

Version 4 of the program features a brand new keyer – the Diamond keyer. This, in common with many of *combustion*'s features, is based on code from *flint* and *flame*. It's a neat tool, enabling you to pick colours for transparency either on the video clip itself or on a diamond-shaped colour chart. Spill suppression and some very flexible selection tools are also available



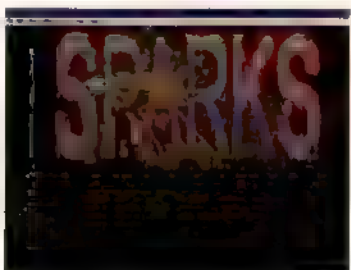
● Particles can be dropped in, adapted or produced from scratch. These sparks are one of *combustion*'s standard presets

which means that even relatively poorly shot footage can be rescued.

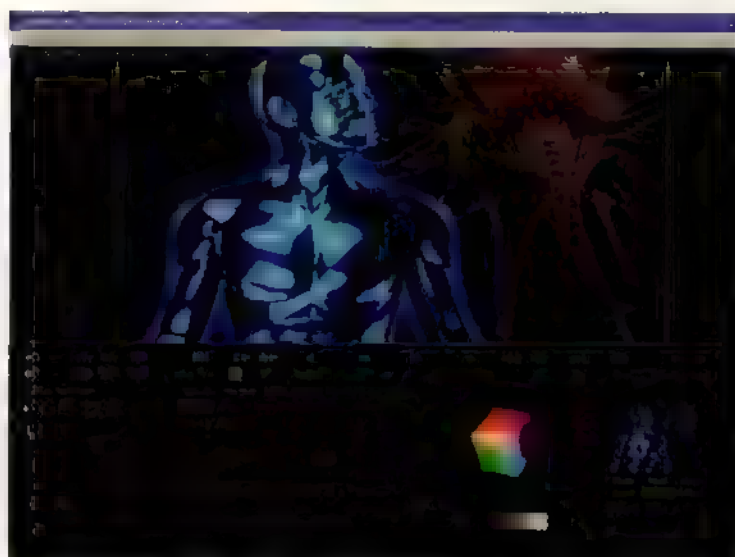
The paint tools are becoming stronger with every release. Version 3 saw custom brushes introduced, and now you can draw a B-Spline to act as a brush. This gives you greater rotokeying options, enabling you to draw around an object and have it replaced with cloned video from a different part of the shot. In addition, you have a high degree of control over the way the edges of your spline are feathered both inside and out. This isn't a massive overhaul of the paint tools, but it means you can remove unwanted objects from your video (or bring in new ones) very easily.

Another great new feature is the ability to create capsules. You can take any sequence of effects applied to a shot and turn them into a capsule – a single effect with whatever controls you want to include. This can be saved to disk and re-used on another project, so you can build up libraries of commonly-used effects and then drop them onto whatever shot you're working on.

The new Timewarp operator offers a higher degree of control over the speed of



● Text comes with a number of options for quick-and-easy application, including features such as write-on and path animation



● Based on code from *flint* and *flame*, the new Diamond keyer enables you to work effectively with difficult shots, retaining transparency and offering useful spill suppression features

your clips than was possible before. You can now keyframe the framerate of a clip and use a spline graph to control it. This enables you to create gradual changes in playback speed: slow the clip to a stop and even run it backwards. There's also a frame blending option you can use to give a smoother look to extremely slow footage.

Ultimately, you can take the basic features of a compositor for granted. All of *combustion*'s tools are powerful, well

COMBUSTION'S FEATURES ARE BETTER TARGETED THAN THOSE OF MOST OF ITS COMPETITORS

implemented and comprehensive. Most are imported directly from *flint* and *flame* and, for the price, you can't really argue with that. This gives the added advantage that you can take files directly from *combustion* to its higher-end siblings for finishing, which means that with a *combustion* setup you can really cut down on time that would otherwise have to be spent using *flame*, potentially saving a lot of money.

combustion also has its fair share of original tools. For instance, the particle system is beautiful; the Timewarp creates some stunning effects and the rotokeying tools compete well with anything on the market, except perhaps dedicated video paint programs such as *Mirage*.

All the main compositing packages have a range of features that are aimed at the 3D user, but *combustion*'s are better targeted than those of most of its competitors, especially if you're a 3ds max user. ●

VERDICT

PROS

- Very strong basic tools
- Compatible with 3D apps
- Well-organised workflow

CONS

- Poor editing app integration
- Unusual interface
- Steep learning curve

RANGE OF FEATURES

9

VALUE FOR MONEY

9

OVERALL

9



Vue 5 Pro Studio

e-on software has extended the functionality of Vue 5 with four new modules, providing you with the ability to fine-tune your scenes

BY MAT BROOMFIELD

DETAILS

PRICE

- Full version £274 / \$399 / €399
- Upgrade from Vue 5 Esprit £136 / \$199 / €199 (prices exclude VAT modules are also available individually)

PLATFORM

PC / Mac

MINIMUM SYSTEM

PC

- Windows 95
- Pentium III 600MHz
- 128MB RAM
- Vue 4 or Vue 4 Pro
- Poser 4

MAC

- Mac OS X or higher
- Power Macintosh G3
- 128MB RAM
- Vue 4 or Vue 4 Pro
- Poser 4

MAIN FEATURES

- Import Poser 4 or 5 animations into Vue 5
- Adjust and tweak lighting
- Edit and 'grow' plants
- Advanced interface for scene navigation

DEVELOPER

e-on software

WEBSITE

www.e-onsoftware.com

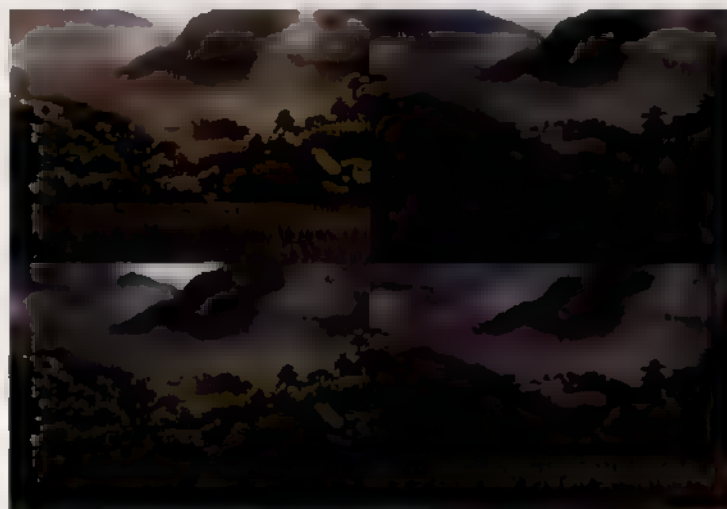


When we reviewed *Vue 5 Esprit* back in issue 59, although we liked the program, we criticised it for lacking some of the functionality of *Vue 4 Pro*. Now e-on software has released a set of modules that add some of that functionality. It's clear that the company is changing its business model to one where *Vue* is sold as a minimal functionality core, which can then be extended via the addition of optional modules. This is an excellent idea, provided the core program remains functional and affordable.

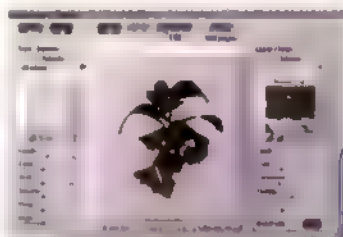
There are four additional modules that upgrade *Vue 5* to *Vue 5 Pro Studio*. They are: *Mover 5* (for *Poser* file import), *Botanica* (a plant tool), *LightTune* (for advanced lighting), and *DeepAccess* (for advanced scene and resources management). Each module is available individually, or you can upgrade from *Vue 5 Esprit* to *Vue 5 Pro Studio* for \$199.

Mover 5 has been available for some time and if you're a *Poser* user, it'll be the most useful part of the bundle. It enables you to import *Poser 4* and *5* characters, complete with animated hair and cloth. As we mentioned when we reviewed it in issue 52, it doesn't support procedural textures, nor does it apply *Vue*'s wind force to dynamic *Poser* elements, such as hair and cloth. However, it does retain a link with the original *Poser* file, modifying your static or animated character as you make changes within *Poser*.

Botanica is a great bonus for anyone who's ever wanted more from the library of plants supplied with *Vue 5*. It enables you



● The four images shown in the screenshot above demonstrate how identical scenes can be modified by using the selective lighting modes within *Vue 5 Pro Studio*'s *LightTune* module



● Grow your own unique plants with the versatile and powerful *Botanica* module

to modify the plants subtly to create new variants, or in major ways to create an entirely new species. It can be accessed within the program by double clicking on a plant in the Summary panel. The plant can then be edited using six parameters: length, falloff, gnarl, diameter, droop and angle. Each of these can be applied to the trunk (or stem) and leaves, and there's also a range of additional settings you can change. The resulting plant can then be saved to the library for future use as required. It's a great tool, but it would have been even better with an export option.

LightTune is fantastic for anyone seeking to create atmospheric lighting. As its name suggests, it enables you to modify the way the lighting works. Of all the modules, the functionality in this one was most needed in the base program. It enables you to specify which objects are affected

by lights, so you can create interesting ray and sunbeam effects. It also enables you to specify which component of a light source affects an object. You can also change the parameters for a light at different distances from the source, which may be useful for generating surreal alien or storm lighting effects.

The final module is *DeepAccess*. This also adds functionality that, in our opinion, should have been in the base program because it provides you with advanced ways to order and select the objects and textures within your scenes. Perhaps the most useful function is the ability to display mixed materials as hierarchies.

Each of the modules provides valuable new functionality, but in our mind, the real value is provided by *Mover* and *Botanica*. ●

VERDICT

PROS

- Valuable way to combine with *Poser* animations
- Great way to add plant variety
- Advanced lighting options

CONS

- Some of this functionality should already be in *Vue 5 Esprit*
- The upgrade is too expensive

RANGE OF FEATURES

10

VALUE FOR MONEY

6

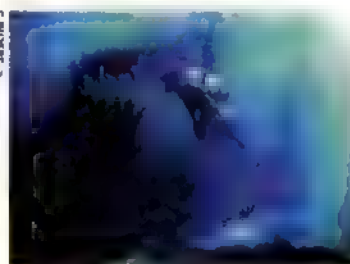
OVERALL

8

RELATED PRODUCTS

- *Vue 5 Esprit*
Reviewed: Issue 59
- *Vue 5 Botanica Pro 4*
Reviewed: Issue 57

© Sascha S



● *Mover* enables you to combine *Poser* animations with your *Vue* scenes, making it one of the most useful of the new additions

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& Office
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**Suburban
House
Models**

DETAILS

FOR
LightWave 3D
PUBLISHER
Kurv Studios
PRICE
£13* / \$25 / €19*
for each DVD
(*Currency conversion)
RUNNING TIME:
2.3 hours each



Character Animation Series: Bone Tools and IK Booster

These two training CDs from Larry 'SplineGod' Shultz aim to introduce the viewer to the new features in *LightWave 8.2*. Both discs include a dozen or so screen-captured *QuickTime* video files, in which Shultz walks you through the subject matter in a manner that's straightforward and accessible to intermediate users, but builds to an advanced level of technical awareness.

The *IK Booster* disc deals with the new IK system in 8.2, a curious addition to the normal IK system that remains commonly

used. The *Bone Tools* disc covers these new features, which have been added to make character rigging in Layout more practical. Thankfully, neither plays like a sales pitch for *LightWave* – new methods are compared and contrasted to old ones, and problems with the software are happily chewed over. Both discs include the same bonus section, with a host of useful extra videos. ●

VERDICT

Excellent, in-depth training that will benefit both intermediate and advanced users

8

DETAILS

FOR
LightWave 3D
PUBLISHER
Epic Software
PRICE
£32* / \$60 / €47*
(*Currency conversion)



LightWave 101

Las Vegas-based Epic Software produces a diverse and eclectic mix of software, 3D models and training products – as well as reselling camera straps – and may be familiar thanks to its *LightWave Applied* books from a few years back.

LightWave 101 is a training CD that aims to introduce a novice to 3D and then to the basics of *LightWave*. However, the contents of this disc are patchy, at best. Buried inside a horribly over-designed interface is a section that gives a child-friendly intro to some basics, followed by a

mass of tutorials in PDF format. This includes a 'course curriculum' neatly broken into six weeks of daily *LightWave* tutorials, 20 or so additional *LightWave* tutorials (why aren't they part of the course curriculum?) and a massive 156-page PDF that includes more tutorials. With the bevy of training materials now available, novices would be advised to spend their money elsewhere. ●

VERDICT

Less a training course and more a random collection of tutorials and extras thrown onto a disk

4



DETAILS

FOR
ZBrush
PUBLISHER
The Gnomon Workshop
PRICE
Introduction to ZBrush,
ZBrush Production Pipeline
and Digital Sculpting:
Human Anatomy
\$69 / £37* / €54* each
Head Sculpting and
Texturing
\$89 / £47* / €69*
(*Currency conversion)

ZBrush DVDs

Pixologic's *ZBrush* modelling and painting application is both astonishing in its functionality and frightening in its complexity. Fortunately, its precipitous learning curve can be eased with these training DVDs.

Overall production values and image quality are excellent, although sound quality is a little variable, but not to any worrying extent. More importantly, the quality of the information is top-notch: tutors Meats Meier and Zack Petroc are both outstanding *ZBrush* artists in their own right, while Gnomon founder Alex Alvarez is good, although not really in the same league.

Of the four packs, we thoroughly recommend *Introduction to ZBrush* as a way of easing yourself into the application's obtuse way of working. This is a great beginners' tool and explains in just a few minutes what it can take several days to work out using just the documentation.

Indeed, for those new to *ZBrush*, we'd suggest getting this pack, along with *ZBrush Production Pipeline*. Between them,

they pretty much cover all aspects of using *ZBrush* in conjunction with your renderer of choice. The only shortcoming is the focus on *Maya*, although the techniques outlined are applicable to most 3D solutions.

The other two sets are more specialised, but no less informative. With a running time of eight hours, *Head Sculpting and Texturing* covers a lot of ground and represents great value. *Human Anatomy* is simply a masterclass in sculpting the male form, and while it's excellent, it's also the least immediately useful.

As a quartet, this is quite a pricey bundle, but if you do buy all four packs, £160 gets you well over 20 hours of lecture time. In addition, the discs should enable you to unlock a lot more of the functionality of Pixologic's astonishing and increasingly popular software. ●

VERDICT

The content ranges from good to excellent, but some DVDs are better value than others

8



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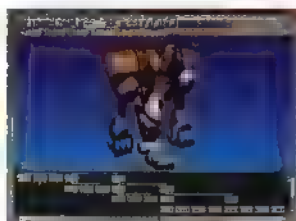
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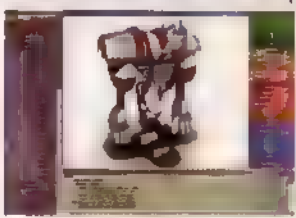
MultiGen® Creator®



MAXON® Cinema-4D® (via LWS)



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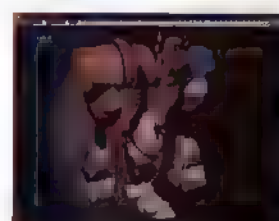
Viewpoint® VET® Streaming



Lightwave®
(original model)



3DS MAX®



PIXAR® Renderman®



Caligari® trueSpace®

Browse, View, Translate, Render All Major 3D File Formats

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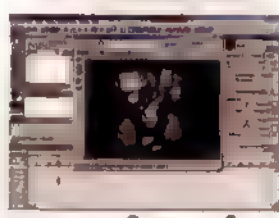
A/W Maya®



"ApeBot" Model Copyright © 2004 by Newtek, Inc
and Matt McDonald Vision Scope Imaging



Robert McNeel's Rhino®



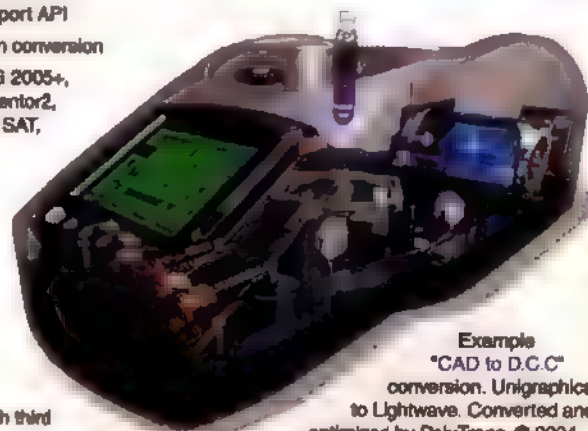
Macromedia® Director® and
Shockwave-3D® Streaming

Common Solutions & Benefits:

- Converts & optimizes all major CAD formats to MAX, Maya, XSI, LW, FLT and dozens more file formats and 3D programs (full list on WEB site)
- Cross-converts between all major animation packages and 3D file formats with true robustness & quality
- Popular for ProE and SolidWorks to DCC
- Highly refined & popular MAX <-> Maya pipeline via native plug-ins, with over a decade of development
- Robust import & rendering of CAD and AEC models
- Publish to WEB streaming file formats such as Viewpoint VET, OpenHSF, SW3D & VRML1+2
- 16+ year development. Personal and dedicated hands on support direct from the Okino developers
- Solid, robust solution used around the world by most major companies and professionals
- Easily develop new plug-in modules such as import/export, renderers, modelers, etc.
- Mesh & scene processing toolset

Major Features:

- New 'document-centric' architecture, extensive user interface plug-in API, and 2D/3D import/export API
- Top notch smooth skinned mesh & skeleton conversion
- New converters: Autodesk Inventor 9, DWG 2005+, BVH & Aclaim (Mocap), FilmBox, SGI Inventor2, OpenNURBS/Rhino3, PDB, Houdini GEO, SAT, FACT, XSI, AI, CATIA v4 + v5 & others
- Integrated polygon reduction system
- Integrated multi-media editor & viewer
- Integrated WEB & file search system
- All Granite CAD converters for US\$395 (ProE, ACIS, IGES, STEP, Parasolids)
- Animation conversion amongst MAX, Maya, XSI, Soft-3D, LW, DirectX, more
- Third generation "PolyTrans-for-3dsmax"
- NVIDIA & ATI real-time shader support, with third generation OpenGL support
- Plug-in modules from third party vendors, including AIR renderer from Siftex Graphics
- Scanline rendering, material editing & texture parameter editing in PolyTrans
- NuGraf only: Caustics, an amazing lens flare system & sunlight calculator



Example
"CAD to D.C.C"
conversion. Unigraphics
to Lightwave. Converted and
optimized by PolyTrans. © 2004
CraneDigital, LLC, www.cranedigital.com.
HACH Odyssey DR/2500 Spectrophotometer.



Excellent support for
third party developers

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VISIT OUR NEW WEBSITE www.3dworldmag.com

This month, the 3D World website underwent a radical makeover. Now completely redesigned, our new online home offers you the opportunity to download past tutorials from the magazine in PDF format, along with some of the best new 3D animated shorts, and bonus material for many of the articles included 3D World.

You can access the website via our homepage, www.3dworldmag.com. As the site is part of the new Computer

Arts design portal, you'll find that the Computer Arts logo appears in the top left corner of the screen once you leave the homepage. Don't be alarmed. Not only is all of the old content there, including the forum and our glossary of 3D technical terms, but there's also a lot more besides.

Best of all, everything – including premium content from our sister magazines *Computer Arts*, *Computer Arts Projects* and *Mac Format* – is available free to 3D World subscribers.

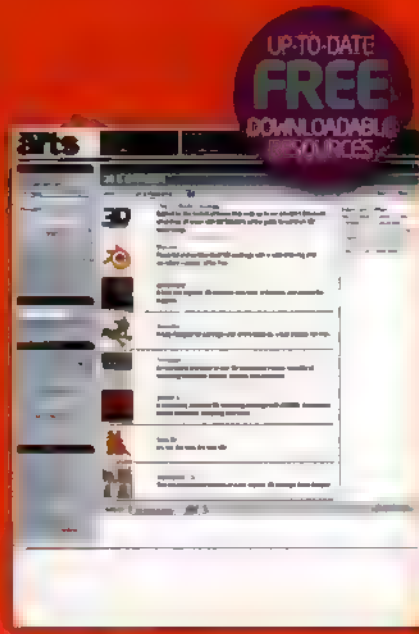


REASONS TO VISIT...

From past tutorials to new animations, the site provides a wealth of free content to download



01 If you subscribe to the print version of 3D World, all online premium content is free! Simply register your details with us online and you'll receive a unique log-in that enables you to access our fully searchable database of tutorials. These expert how-tos normally cost between 99p and £2.50 each.



02 Every month, we'll be adding the best new 3D animated shorts along with exclusive marketing information, game make-promotional offers and more. All this content is available to our subscribers for free.



03 If you want to know how to master a new digital creative technique, whether it's 3D, animation, Photoshop or even graphic design, you'll find what you're looking for in our new Tutorials section. Each tutorial is a step-by-step guide to help you learn a new technique.

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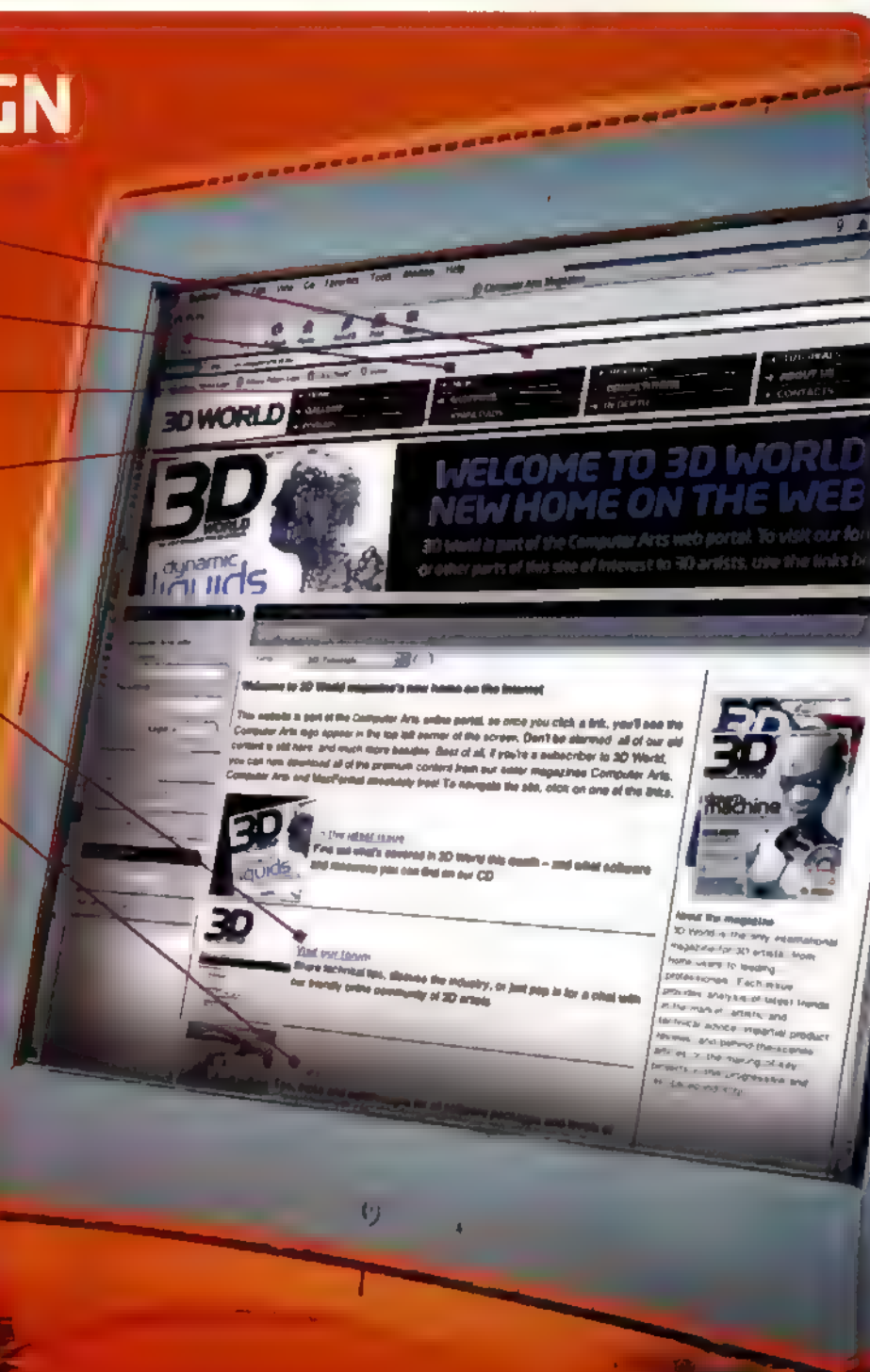
The world's best selling magazine for digital artists and designers. Computer Arts provides a one stop shop for advice on creating digital art and illustrations, with contributions from leading professionals in the field.



Each Issue of Computer Arts Projects gives you a detailed guide to a different creative subject. Recent issues have covered print and web design, Photoshop and how to start your own design business.



The number one-selling consumer Mac magazine, full of practical and passionate advice. 3D World's readers can expect to find a range of expert tutorials, plus the best hardware and software reviews.



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Buyers' guide

Whether you want advice on choosing a specific software package, or an overview of what's on the market, this database of past 3D World reviews contains the information you need to make the right buying decision

Online Resources



● This guide lists prices in Pounds Sterling and US Dollars. For a quick currency conversion: www.xe.com



● For non-3D software, our new online portal holds a wide range of reviews: www.computerarts.co.uk

When new 3D users contact the magazine, the most common question they ask is, "Which software package should I buy?" To which the honest response is: "That really depends on you."

Unlike Web design or 2D illustration, there's no single, well-established software package that all professionals use. Instead, choosing a 3D application is largely a matter of personal requirements, not to mention individual taste. Before you begin downloading demos, however, it does help to have a broad overview of what's available – and that's where this buyers' guide comes in.

In this guide, you'll find a list of the key software packages in a particular market sector, the issue of the magazine in which each one featured and a brief summary of the review. These summaries represent a single reviewer's opinion, but they should give you an idea of the key characteristics of each application.

QUESTIONS, QUESTIONS...

Before diving in, there are two fundamental questions you should ask. Firstly, are you pursuing 3D as a professional career? And secondly, what kind of 3D work do you aim to produce?

If the answer to the first question is 'no', the only limitations on your choice of 3D software are your budget and operating system. In the hands of a skilled user, inexpensive applications can generate impressive results, although they might not do so as quickly as more expensive software (or in a way that professional 3D artists would deem conventional).

If you do aim to make a living in 3D, however, you'd be well advised to pick a 'professional' application. Those listed in the upper table on the page opposite. Expensive packages don't necessarily generate better results, but they tend to produce work quickly

flexibly and reliably – all important issues if deadlines are looming. And while studios don't usually hire staff solely on the basis of the software they've used, mastering a name application will familiarise you with high-end tools and increase your chances of freelance work.

Another consideration is whether you intend to produce animations or still images. As a crude generalisation, illustrators and graphic artists often favour pro applications at the lower end of the price scale, while those working in animation, visual effects or game design tend to opt for more expensive packages.

Ultimately, however, there's no substitute for hands-on experience. All major applications have demo versions that you can

CHOOSING APPLICATIONS IS ALL ABOUT PERSONAL REQUIREMENTS AND INDIVIDUAL TASTE

download and experiment with, and before you reject the more expensive packages, remember that many of them – particularly *Maya*, *Houdini*, *LightWave* and *Softimage|XSI* – have free 'learning' editions. Educational deals also offer students the chance to buy full versions of professional software for the price of a handful of DVDs. To see if you qualify, check the website of the software package you're interested in.

Fortunately, there are very few 'bad' 3D packages on the market, so choosing the right one for you ultimately comes down to personal taste. Do your research, consult the magazine, and be prepared to experiment – but above all, enjoy yourself!

ALL-ROUND 3D PACKAGES (UNDER £250)

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	REMARKS	SCORE
ALIST MOVIE 3D	PC	Cut-down version of Autodesk's aimed mainly at home movie-makers' dubbing a 3D	£149 (US\$199)	Alist	www.alist.com	N/A	[Not previously reviewed in 3D World]	N/A
CARRARA 3D BASICS	Mac/PC	Extremely stripped-down version of a mid-price app aimed at hobbyists and casual users	£19 (US\$29)	Evolve	www.evolve.com	N/A	No previous experience with Evolve	N/A
CARRARA 4 STANDARD	Mac/PC	Inexpensive all-rounder lacking some of the high-end tools from Carrara 4 Professional	£149 (US\$199)	Evolve	www.evolve.com	60	Still a solid purchase for a movie all-round 3D user on a budget. Carrara 4 offers bugs from earlier versions, but lacks the new rendering tools of the Professional	6
GAMESPACE	PC	Cut-down true 3D with extra games tools aimed at hobbyists and casual users	£149 (US\$199)	Caligari	www.caligari.com	34	From some work to including a complete solution for the most commonly used 3D applications on release. Those on a tight budget may stick to freeware	7
HASH ANIMATION MASTER	Mac/PC	Cut entry-price animation app chosen by many leading animators for personal work	£149 (US\$199)	Hash Inc.	www.hash.com	59	Powerful intuitive rigging and animation package complemented by a simple versatile modeler. Now adds hair support and a spline-based particle system	9
PIXELS 3D 5	Mac	The premier (and possibly only) Mac-only 3D package a cut app amongst Mac fans	£149 (US\$199)	Pixelogix	www.pixelogix.com	3	Great value for money, and includes a number of high-end tools including fluids and cloth code render quality, but very slow, and workflow could be improved	8
REALSOFT 3D 4.5 (FOR LINUX)	Linux	Even better value than the PC edition, most Linux users may opt relative to freeware	£149 (US\$199)	Realsoft Graphics	www.realsoft.com	35	Excellent render quality for the price, but more suited to still images than animation work, particularly character animation. OpenGL could be improved	9
SHADE 7 DESIGNER LE	Mac/PC	Very inexpensive if limited all-round package extremely popular with hobbyists in Japan	£149 (US\$199)	Curious Labs	www.curiouslabs.com	50	Clearly geared towards the student or amateur. Its cheap and cheerful version of its bigger siblings shares the basic modeling tools but is otherwise limited	7
SHADE 7 STANDARD	Mac/PC	Mid-level edition more expensive than LE but lacks some key tools of Shade 7 Pro	£149 (US\$199)	Curious Labs	www.curiouslabs.com	58	Similar in toolset to the Professional edition, but lacks automatic unrolling, a UV map position. A reasonable buy if you can handle the animation issues	7

ALL-ROUND 3D PACKAGES (OVER £250)

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	SCORE	VERDICT	SCORE
3DS MAX 7	PC	Long-established 3D package still a standard in the games and architecture industries	£2,695 (\$3,495)	Autodesk	www.autodesk.com	59	No major 'hero' features, but improved stability, integrated character studio, and new Normal Mapping and character animation tools make this a worthy upgrade	9
CARRARA 4 PRO	Mac/PC	Inexpensive 3D modelling tool, now targeted more specifically at professional illustrators	£419 (\$279)	Curious Labs	www.curiouslabs.com	60	Retains Fourth Edition's positively offputting 'system of workflow' divided between toolsets, but dramatically improves animation - a sign of its reliability	8
CINEMA 4D 8 BASE	Mac/PC	Entry-level edition, only some important tools missing compared to studio editions	£445 (\$665)	Maxon	www.maxon.net	60	Not as groundbreaking an upgrade as version 8.0, but builds on previous version's strengths, a useful all-round professional 3D package	9
CINEMA 4D 8 XL	Mac/PC	A powerful render engine, but increasingly respected over the choice of many illustrators	£1,149 (\$1,695)	Maxon	www.maxon.net	60	Not as often not specifically reviewed in 3D World. Prior to this, Lightwave but the MOCCA and Advanced Render modules are essential to many illustrators	9
CINEMA 4D 8 STUDIO	Mac/PC	Top-level edition of Cinema 4D adding in BodyPaint 2 and unlimited network rendering	£1,871 (\$2,995)	Maxon	www.maxon.net	58	(This edition not specifically reviewed in 3D World) Primarily for large facilities needing unlimited render licenses, although BodyPaint 2 is a useful added extra	9
EMAS 5.5	Mac/PC	Professional professional-quality animation package with a strong 2D following	£467 (\$705)	Electronic Arts	www.electronicart.com	62	Still an impressive first-rendering and animation package, but now lacks a lead in modeling since the last, admittedly thorough, point-five upgrade	8
HOUZINI 7 SELECT	PC/Linux	Entry-level edition, primarily aimed at studios looking for a turnkey solution	£825 (\$1,595)	Side Effects Software	www.sidefx.com	65	Reviewed at version 5. A good additional seat for a Houdini studio, but lack of advanced features makes it less of a standalone package	7
HOUZINI 7 MASTER	PC/Linux	Powerful version for animation studios, few skilled users, but a staple of much 3D work	£8,900 (\$13,900)	Side Effects Software	www.sidefx.com	61	Reviewed at version 6. Retains all the power of previous versions, but makes considerable advances in terms of ease of use. Also adds a new render engine	8
LIGHTWAVE 9D 8	Mac/PC	Another long-established package used in a wide range of work, including TV titles	£995 (\$1,495)	Newtek	www.newtek.com	63	Vestly improves character animation and dynamics, and streamlines workflow	8
MAYA 6.5 COMPLETE	Mac/PC/Linux	And some high-end tools, but an extremely priced edition of Maya for many illustrators	£1,499 (\$2,295)	Autodesk	www.autodesk.com	64	It might have incrementally improved modeling and faster animation tools, but there's still no proper ops for mental ray and the proves head more work	7
MAYA 6.5 UNLIMITED	Mac/PC/Linux	Powerful all-around package, but the most expensive edition of Maya for many illustrators	£4,499 (\$6,995)	Autodesk	www.autodesk.com	61	Still a leading 3D package, but the price is not a good one for many illustrators	7
REALSOFT 3D 5 (FOR PC)	PC	Underused, but well-regarded mid-priced application goes out in 3D work	£415 (\$795)	Realsoft	www.realsoft.com	62	Enhanced Sub-D modeling and texturing make this a viable alternative to better-known 3D illustration apps, still weak at character animation, however	9
SHANE 3 PRO	Mac/PC	Very popular Japanese package. Still mostly unknown outside the anime community	£521 (\$795)	Curious Labs	www.curiouslabs.com	59	Robust modelling tools and a reasonably powerful renderer, but the interface is a little dated	7
SOFTIMAGE(XSI) 4 FOUNDATION	PC/Linux	Appropriately marketed entry-level edition of a leading 3D app, very powerful for the price	£294 (\$445)	Autodesk	www.softimage.com	60	First featured in many entry-level editions of major packages. Four editions originally sold for a 100% - sets a new world mark for 3D software pricing	9
SOFTIMAGE(XSI) 4 ESSENTIALS	PC/Linux	Powerful well-balanced all-round package, still a staple of much 3D work	£1,275 (\$1,995)	Autodesk	www.softimage.com	55	A solid upgrade to a powerful package, adding new rigid-body dynamics, a fully integrated lighting workflow and improved rendering and material tools	9
SOFTIMAGE(XSI) 4 ADVANCED	PC/Linux	Widely used in games and VFX, struggles for market dominance with 3ds max and Maya	£4,499 (\$6,995)	Autodesk	www.softimage.com	55	For (game) users, XSI 4 Advanced also throws in Houdini and eight satellite product licenses for free. A no-decent NURBS or curve tools, though	9
STRATA 3D GX	Mac/PC	Long-established, if relatively niche, mid-price 3D package, now mostly unknown	£345 (\$525)	Strata	www.strata.com	55	A capable, if idiosyncratic, package for a print graphic artist looking to team 3D with 2D illustration work	7
TRIPLEX 6.5	PC	Another fixture in the increasingly crowded mid-range 3D software market	£1,199 (\$1,795)	Autodesk	www.autodesk.com	58	Impressive animation capabilities, but the RIA addresser may not be the best for many illustrators	8

TEXTURING

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	SCORE	VERDICT	SCORE
BODYPAINT 3D 2	Mac/PC	Powerful specialist 3D painting software, now increasingly high-profile for illustrators	£425 (\$645)	Curious Labs	www.curiouslabs.com	47	Much quicker and simpler to use than the first release, and results can be as good as those of professional 2D artists	9
DEEP PAINT 3D 2	PC	Established 3D painting app, but not recently updated, and using results as BodyPaint	£407 (\$595)	Right Hemisphere	www.righthemisphere.com	40	Powerful, but RAM-hungry, and advanced mapping tools are relegated to a separate app. Deep 3D has recently updated, however, unlike BodyPaint 3D	8
PAINT 3D PRO 2	PC	Inexpensive 3D painting and bitmap editing app, unfairly regarded as 'just for hobbyists'	£99.95 (\$149.95)	Corel	www.corel.com	57	Fantastic value for money, and very user-friendly. A proper 'story palette' does nearly anything that Photoshop can, but needs better Alpha channel support	9
PHOTOSHOP CS	Mac/PC	The de facto standard for texture painting, but not always the best for 3D work	£115 (\$175)	Adobe	www.adobe.com	40	Still de rigueur for professional 3D work. Few must have features for 3D work in Photoshop CS, but it's a good starting point for many illustrators	8

TALKING POINT | Why use dedicated texturing software?

FOR MANY 3D ARTISTS, the terms 'texturing' and 'Photoshop' are virtually synonymous. After all, it's a simple matter to export a UV layout from your 3D package, then use it as a guide for painting or layering textures. So why bother with specialist software? Well, for one thing, a dedicated 3D painting package allows you to visualise the results of your work in three dimensions: no more

unexpected issues with seams or texture projections. For another, software like BodyPaint 3D allows you to paint on up to ten channels at a time: instead of showing a colour, one paint stroke can define an entire material. But, at \$745 per seat, the cost can prove offputting. To decide if the investment is worthwhile, check out our Q&A section.

You can find our BodyPaint Q&A on page 76.

MODELLING

PRODUCT	FORMAT	DESCRIPTION	PRICE	CONTACT	WEBSITE	SCORE	REMARKS
AC3D	Windows	Low-cost modeller with poly, NURBS and Render, mainly aimed at games work	£199	Autodesk	www.autodesk.com	5.5	Not previously reviewed in 3D World
AMAPI DESIGNER 7	Windows	High-end solid and NURBS modeller with a unique work flow and a soft surface	£1,990	Autodesk	www.autodesk.com	9	A robust modelling package with a highly intuitive interface, although users beware of the steep learning curve and the need for a high-end workstation
AMAPI 7.5 PRO	Windows	Autodesk's new bigger sibling intended as a serious alternative to professional packages	£2,990	Autodesk	www.autodesk.com	9	Professional version of Amapi aimed at industrial modelling. Awesome dynamic geometry and better NURBS modelling but the rendering validation is tricky
AMORPHUS 3	Windows	High-end NURBS modeller, a little more modular with 100% NURBS, but not really updated	£1,990	Autodesk	www.autodesk.com	6	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
FORMEZ 2	Windows	Powerful, long-established all-round modeller used on a wide range of industrial projects	£799	Formez	www.formez.com	8	This is a premium modelling package - a hybrid solid and surface modeller with strong NURBS tools and decent rendering. It has a steep learning curve
MODEL	Windows	Powerful, long-established all-round modeller used on a wide range of industrial projects	£1,990	Autodesk	www.autodesk.com	8	A robust, modular, high-end all-round modeller with a steep learning curve and a high-end workstation
RHINO 3	Windows	High-end NURBS modeller, a little more modular with 100% NURBS, but not really updated	£1,990	Autodesk	www.autodesk.com	8	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
SILO 1.3	Windows	New character modelling package, designed for use with Maya	£1,990	Autodesk	www.autodesk.com	9	As expected, it's a character modelling package, designed for use with Maya
ZBRUSH 2	Windows	High-end NURBS modeller, a little more modular with 100% NURBS, but not really updated	£1,990	Autodesk	www.autodesk.com	9	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve

CHARACTER AND FACIAL ANIMATION

PRODUCT	FORMAT	DESCRIPTION	PRICE	CONTACT	WEBSITE	SCORE	REMARKS
DAZ3D	Windows	Long-standing new tool for character animation, still available as a free beta	£199	Autodesk	www.autodesk.com	5.5	Not previously reviewed in 3D World
ENDORPHIN 1.6	Windows	Innovative motion synthesis tool, designed for use with Maya	£1,990	Autodesk	www.autodesk.com	9	A robust, modular, high-end all-round modeller with a steep learning curve and a high-end workstation
FACESTATION 2	Windows	Turn video footage of an actor's face into instant animation for 3D models	£1,990	Autodesk	www.autodesk.com	8	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
LIFESTUDIO:HEAD 2.5 STANDARD EDITION	Windows	Character animation tool, designed for use with Maya	£1,990	Autodesk	www.autodesk.com	8	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
LIFESTUDIO:HEAD 2.5 PRO ARTIST	Windows	Character animation tool, designed for use with Maya	£1,990	Autodesk	www.autodesk.com	8	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
MOTIONBUILDER 6	Windows	Character animation tool, designed for use with Maya	£1,990	Autodesk	www.autodesk.com	8	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
MOTIONBUILDER 6 PRO	Windows	Character animation tool, designed for use with Maya	£1,990	Autodesk	www.autodesk.com	8	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
POSER 5	Windows	Character animation tool, designed for use with Maya	£1,990	Autodesk	www.autodesk.com	8	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve

RENDERING

PRODUCT	FORMAT	DESCRIPTION	PRICE	CONTACT	WEBSITE	SCORE	REMARKS
AIR	Windows	Low-cost renderer, designed for use with Maya	£199	Autodesk	www.autodesk.com	5.5	Not previously reviewed in 3D World
ART-LANTIS 4.5	Windows	High-end solid and NURBS modeller with a unique work flow and a soft surface	£1,990	Autodesk	www.autodesk.com	9	A robust modelling package with a highly intuitive interface, although users beware of the steep learning curve and the need for a high-end workstation
BRAZIL R/S	Windows	High-end solid and NURBS modeller with a unique work flow and a soft surface	£1,990	Autodesk	www.autodesk.com	9	A robust modelling package with a highly intuitive interface, although users beware of the steep learning curve and the need for a high-end workstation
FINAL RENDER STAGE 1	Windows	High-end solid and NURBS modeller with a unique work flow and a soft surface	£1,990	Autodesk	www.autodesk.com	7	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
MENTAL RAY 3	Windows	High-end solid and NURBS modeller with a unique work flow and a soft surface	£1,990	Autodesk	www.autodesk.com	8	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
POV RAY	Windows	High-end solid and NURBS modeller with a unique work flow and a soft surface	£1,990	Autodesk	www.autodesk.com	8	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
RENDERMAN 12	Windows	High-end solid and NURBS modeller with a unique work flow and a soft surface	£1,990	Autodesk	www.autodesk.com	8	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
TURTLE	Windows	High-end solid and NURBS modeller with a unique work flow and a soft surface	£1,990	Autodesk	www.autodesk.com	7	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve
V-RENDER	Windows	High-end solid and NURBS modeller with a unique work flow and a soft surface	£1,990	Autodesk	www.autodesk.com	8	A high-end NURBS modeller, but only has a few tools, a crude interface and a steep learning curve

COMPOSITING AND EFFECTS

PRODUCT	FORMAT	DESCRIPTION	PRICE	OS/COMP	URL	SCORE	REMARKS	EDITOR'S CHOICE
AFTER EFFECTS 5 STANDARD	Mac/PC	Top of the third-generation compositing packages, usable even for broadcast work	£495 (\$699)	Adobe	www.adobe.com	47	Adobe's new painting features, plus the addition of Motion blur, make it a major upgrade. Still the same cluttered, time-consuming	8
AFTER EFFECTS 5 PROFESSIONAL	Mac/PC	As After Effects Standard, but with more advanced tools for professional work	£595 (\$899)	Adobe	www.adobe.com	47	After Effects 5 Professional adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	8
COMBUSTION 3	Mac/PC	Another top-tier compositing package, from Autodesk	£495 (\$699)	Autodesk	www.autodesk.com	47	Combustion 3 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	9
OFX 4	Mac/PC	Out-of-the-box modular version of Digital Fusion	£495 (\$699)	Autodesk	www.autodesk.com	47	Most of the improvements in OFX 4 are cosmetic, but still powerful	8
DIGITAL FUSION 4	Mac/PC	The top of the compositing packages, but with a more modular approach	£495 (\$699)	Autodesk	www.autodesk.com	47	Digital Fusion 4 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	8
MOTION 5	Mac/PC	Entry-level motion graphics package, suitable for simple compositing, titling, and effects	£195 (\$299)	Adobe	www.adobe.com	47	Motion 5 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	8
SHAKE 3.5	Mac/PC	Another top-tier compositing package, from Apple	£495 (\$699)	Apple	www.apple.com	47	Shake 3.5 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	8

CAMERA TRACKING AND MATCH MOVING

PRODUCT	FORMAT	DESCRIPTION	PRICE	OS/COMP	URL	SCORE	REMARKS	
3D-EQUALIZER 3	Mac/Linux	Generalist and specialist tracking, with a focus on 3D tracking	£495 (\$699)	Autodesk	www.autodesk.com	47	3D-Equalizer 3 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	N/A
BOUYOU 3	Mac/PC/Linux	One of the best motion tracking packages, with a focus on 3D tracking	£495 (\$699)	Autodesk	www.autodesk.com	47	Boyou 3 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	6
BOUYOU BULLET	Mac/PC/Linux	Another top-tier motion tracking package, from Autodesk	£495 (\$699)	Autodesk	www.autodesk.com	47	Boyou Bullet adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	7
MATCHMOVER PRO 3.1	Mac/PC/Linux	Another top-tier motion tracking package, from Autodesk	£495 (\$699)	Autodesk	www.autodesk.com	47	MatchMover Pro 3.1 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	7
PPTAGE	Mac/PC	Another top-tier motion tracking package, from Autodesk	£495 (\$699)	Autodesk	www.autodesk.com	47	Pptage adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	9
PPTATCH	Mac/PC	Another top-tier motion tracking package, from Autodesk	£495 (\$699)	Autodesk	www.autodesk.com	47	Pptatch adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	8
PPTTRACK 2	Mac/PC	Another top-tier motion tracking package, from Autodesk	£495 (\$699)	Autodesk	www.autodesk.com	47	Ppttrack 2 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	9
SYNTHWIRE	Mac/PC	Another top-tier motion tracking package, from Autodesk	£495 (\$699)	Autodesk	www.autodesk.com	47	Synthewire adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	9

LANDSCAPE GENERATION

PRODUCT	FORMAT	DESCRIPTION	PRICE	OS/COMP	URL	SCORE	REMARKS	
BOUYOU 3	Mac/PC	One of the best landscape generation packages, with a focus on 3D tracking	£495 (\$699)	Autodesk	www.autodesk.com	47	Boyou 3 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	8
MOJOWORLD 3	Mac/PC	Another top-tier landscape generation package, from Autodesk	£495 (\$699)	Autodesk	www.autodesk.com	47	Mojoworld 3 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	6
VUE 4 PROFESSIONAL	Mac/PC	Another top-tier landscape generation package, from Autodesk	£495 (\$699)	e-on Software	www.e-onsoftware.com	46	Vue 4 Professional adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	8
VUE 5 ESPRIT	Mac/PC	Another top-tier landscape generation package, from Autodesk	£495 (\$699)	e-on Software	www.e-onsoftware.com	47	Vue 5 Esprit adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	9
WORLD CONSTRUCTION SET 6	Mac/PC	Another top-tier landscape generation package, from Autodesk	£495 (\$699)	e-on Software	www.e-onsoftware.com	47	World Construction Set 6 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	8
WORLD BUILDER GENESIS	Mac/PC	Another top-tier landscape generation package, from Autodesk	£495 (\$699)	e-on Software	www.e-onsoftware.com	47	World Builder Genesis adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	7
WORLD BUILDER PRO 4	Mac/PC	Another top-tier landscape generation package, from Autodesk	£495 (\$699)	e-on Software	www.e-onsoftware.com	47	World Builder Pro 4 adds more advanced tools for professional work, but the interface is still cluttered and the learning curve is steep	7

TALKING POINT | One landscape app to rule them all?

LANDSCAPE-GENERATION SOFTWARE forms a loose continuum between artistic accessibility and ease of use, with two product lines - Vue and WorldBuilder - vying for control of the middle ground. But are the

new modular add-ons for Vue 5 Esprit enough to maintain the current market leader's edge? You can find out what we thought in this month's reviews section. For more details, turn to page 94

WEB 3D AND MULTIMEDIA

PRODUCT	FORMAT	DESCRIPTION	PRICE	FILE SIZE	WEBSITE	FILE	REMARKS	SCORE	
ANARK STUDIO 3	HL	Established authoring package for interactive 3D presentations.	£145 (US\$249)	100MB	Anark	www.anark.com	64	A powerful solution for large-scale real-time 3D, but the new higher price and absence of Mac support will leave some existing users high and dry.	8
AXLEDGE 2	Win/PC	All-in-one authoring and online animation package, designed for the future in 3D.	£100 (US\$165)	50MB	Madagascar	www.madagascar.com	64	Powerful all-round authoring package with good animation and a rich selection of editing tools, import and export options much improved since version 2.0.	8
CUT3D	Win/Mac	Free software suite for exporting 3ds max and Maya models in interactive online format.	Free	45MB	Cybere	www.cybere.com	16	[Reviewed using the 3ds max exporter] Relatively straightforward to use, with a good range of options in the exporter. Very much more stable in recent builds.	7
DIRECTOR MK2004	Win/PC	De facto standard for authoring multimedia. Drivulus now incorporating native 3D tools.	£899 (US\$1,499)	100MB	Autodesk	www.autodesk.com	64	Consistently improved layout, but few new 3D tools since version 8.5. Many physics and useful web output tools, but programming oriented for complex effects.	7
QUESTED 2.1 ENTERPRISE	Win/PC	Real-time 3D authoring tool, also available in cheaper site and professional editions.	£1,199 (US\$1,999)	100MB	Quest 3D	www.quest3d.com	64	Full-featured all-round authoring tool, but fairly easy to master. No programming required, can become unmanageably cluttered on complex projects, though.	8
SWIFT 3D 4	Win/PC	3D interactive graphics package, first of the most regularly updated interactive 3D apps.	£99 (US\$165)	100MB	Flasher	www.flasher.com	64	No more new tools, but overall stability has improved. Still 3D 1.0. Flasher maturing as a package, web sites and animations quickly and painlessly.	9
WIREFUSION 4 ENTERPRISE	Win/PC	Virtual authoring tool for interactive 3D content, also available in cheaper editions.	£1,199 (US\$1,999)	100MB	Detonix	www.detonix.com	64	Straightforward all-round authoring solution, no need for programming or specialist plug-ins to view output. Slightly unorthodox, but quick to master.	8

OTHER TOOLS

PRODUCT	FORMAT	DESCRIPTION	PRICE	FILE SIZE	WEBSITE	FILE	REMARKS	SCORE	
3D SCULPTOR	HL	Image-based modelling software, not as powerful as other 3D sculptors, but offers greater automation and can use uncalibrated images for texturing.	£149 (US\$249)	100MB	Creative Dimensions Software	www.3dscliptor.com	64	Requires photos of an object against a marker grid via D-Sculptor or iModeler, but offers greater automation and can use uncalibrated images for texturing.	8
D-JONKER	Win/PC	Photo stitching software, for creating panoramas, but suitable for many projects.	£100 (US\$165)	100MB	D-Jonker	www.d-jonker.com	64	In good hands, it does what it's meant to do, but it suffers from a lack of auto features and poor usability. Documentation is disappointingly skimpy.	7
D-SCULPTOR 3 STANDARD	HL	Image-based modelling software, another mid-priced package aimed at home users.	£149 (US\$249)	100MB	Detonix	www.d-sculptor.com	64	[Reviewed at version 1.1] A good tool for creating 3D models from images, and cheaper than iModeler. Mac version not out as powerful, however.	8
DEEREXPLORATION 3.5	Win/PC	File conversion software, capable of creating a wide range of file formats, including LZW.	£79 (US\$129)	100MB	Deerex	www.deerex.com	64	Well-designed model viewer, file conversion and asset management utility. Includes basic 3D model editing tools, rendering and screenshot output.	8
FRAMEFORGE 3D STUDIO	Win/PC	Image-based modelling software, for creating 3D models, but suitable for many projects.	£149 (US\$249)	100MB	FrameForge Software	www.frameforge3d.com	64	Extremely easy to use, and scales to even high-budget movies. Specialised props are available as add-on packs, though, and complex scenes can be sluggish.	9
IMAGEMODELER 4	Win/PC	Image-based modelling software, one of the best mid-range packages available.	£149 (US\$249)	100MB	Detonix	www.imagemodeler.com	64	Good professional quality results, and can cope with architectural-sized objects. Requires calibration, but user-friendly. Quality also suffers at a price.	7
IMODELER 3D 2.1 WEB	Win/PC	Image-based modelling software, for creating 3D models, but suitable for many projects.	£149 (US\$249)	100MB	Detonix	www.imodeler.com	64	Image-based modelling software, for creating 3D models, but suitable for many projects.	6
IMODELER 3D 2.1 PRO	Win/PC	Image-based modelling software, for creating 3D models, but suitable for many projects.	£149 (US\$249)	100MB	Detonix	www.imodeler.com	64	Image-based modelling software, for creating 3D models, but suitable for many projects.	6
MUGSHOT	Win/PC	File conversion software, powerful with support for batch conversion and LZW data.	£149 (US\$249)	100MB	Detonix	www.mugshot.com	64	[Reviewed at version 4.1] This affordable package performs a demanding task exceptionally well and is relatively affordable. User interface is a bit dated.	8
PARTICULATION 3	Win/PC	Particle software, generates 3D particle effects, but suitable for many projects.	£149 (US\$249)	100MB	Detonix	www.particulation.com	64	A fast, flexible alternative to conventional 3D particle effects, and fits well into production pipelines. Would use a graphics card more specifically, but user-friendly.	8
POLYTRANS 4	Win/PC	Image-based modelling software, for creating 3D models, but suitable for many projects.	£149 (US\$249)	100MB	Detonix	www.polytrans.com	64	[Reviewed at version 4.1] Not your everyday 3D program, but a very useful one that all 3D artists should consider. Conversion does it always, or so it seems.	7
REALFLOW 3	Win/PC	Fluid simulation software, for creating 3D models, but suitable for many projects.	£149 (US\$249)	100MB	Detonix	www.realflow.com	64	Sets the benchmark for power and controllability for fluid simulation systems, but at a price. Not as stable as other systems, particularly in the Mac version.	7
STITCHER 4.0	Win/PC	Image-based modelling software, for creating 3D models, but suitable for many projects.	£149 (US\$249)	100MB	Detonix	www.stitcher.com	64	Image-based modelling software, for creating 3D models, but suitable for many projects.	7
STITCHER 4.0	Win/PC	Image-based modelling software, for creating 3D models, but suitable for many projects.	£149 (US\$249)	100MB	Detonix	www.stitcher.com	64	Image-based modelling software, for creating 3D models, but suitable for many projects.	8

CONTACT US | Have we missed anything?

THINGS CAN CHANGE very quickly in the world of 3D software. If you've spotted an error in this buyer's guide, please contact us at the email address below. However, before writing in, please bear the following points in mind:

1. All prices exclude VAT and shipping, plus any optional extra costs, such as printed manuals or maintenance contracts.
2. Asterisks denote currency conversions from a list price at the current rate of exchange when the entry was added to the buyer's guide.

3. Due to limitations of space, not all sectors of the 3D market can be covered each issue. We aim to vary our listings from month to month.

4. Space also precludes us from listing the thousands of plug-ins currently available.

5. The verdict column contains a synopsis of our last published review. In most cases this will refer to the current version of the software. Where this is not so, it should be clearly noted.

To notify us of an error in this buyer's guide, contact us at: 3dworld@futurenet.co.uk

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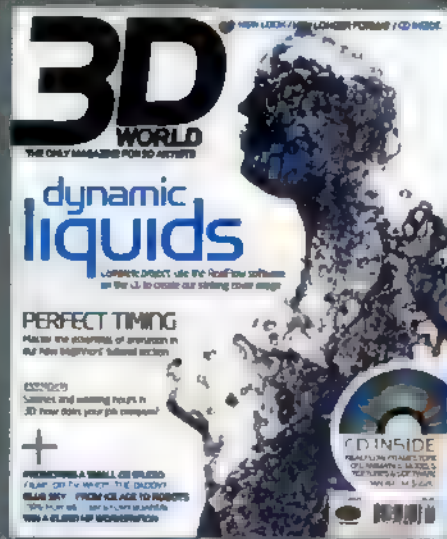


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3D World | BACK ISSUES

BACK ISSUES

Missed an issue of 3D World? Contact our back issues department to see if there are any left!



ISSUE 64
DYNAMIC LIQUIDS
May 2005

Recreate our cover image in RedFlow behind the scenes on Robots, typical salaries and working hours in 3D. Exclusive survey.

ON THE DISC
RedFlow 3 (demo), plus
Framestore CFC animations,
model 3D textures and
software world, \$220



ISSUE 63
THE BRITS ARE COMING
April 2005

An exclusive look at the making of *Valiant*, previews of the best new European 3D films, lip synchronizing with audio in .ogg, .mp3, .wav, best PC & graphics cards on test

ON THE LIST
Mimic 2 (full software)
plug-ins: models and facial mapping data worth \$1,100



ISSUE 62 DREAM MACHINE
March 2005
ON THE DISC
 JENNA 2.2 plug-in for C4D,
 worth \$200 Plus 2Brush
 and 3ds max tutorials



ISSUE 61 RISING STARS
February 2005
ON THE DISC
Full copy of *trueSpace4 3*,
as sold for \$595, six Pixel
Corps training videos

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TODAY** PAGE 40

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Useful information for 3D artists seeking work. This issue **Sony Computer Entertainment Europe**

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- The Getaway
- EyeToy
- SingStar Formula 1 series
- WipeOut Pure

HR CONTACT

HRAdmin@scee.net

URL

www.scee.com, www.playstation.com

TYPE OF WORK UNDERTAKEN

Development of PS2, PSP and next-gen PlayStation games

NUMBER OF FULL TIME EMPLOYEES

788

TYPICAL NUMBER OF FREELANCERS

Varies depending on the project

TYPICAL NUMBER OF FULL TIME RECRUITS PER YEAR

Planning to recruit 200 people this year (to March 2006)

LOOKING FOR USERS OF WHICH 3D SOFTWARE?

Maya is our standard in-house modelling tool. We recruit on the basis of talent rather than software knowledge

KEY SKILLS FOR EMPLOYEES

We value strong observational skills and the ability to follow art direction as essential core abilities. We also look for good problem solvers and creative thinkers

DESIRABLE SKILLS FOR EMPLOYEES

As our games are becoming highly cinematic, we are particularly looking for experience in production design, cinematography, visual effects and lighting design

A TYPICAL EMPLOYEE AT SCEE IS

Passionate, inventive, dedicated, talented, ambitious

CURRENTLY HIRING FOR

A wide range of projects on PS2, PSP and next-generation PlayStation formats

NUMBER OF JOBS, AND IN WHAT AREAS OF EXPERTISE?

A huge range, at all levels of experience, although we're particularly looking to grow our character and animation departments. We're also looking for experienced senior people to lead teams and work on photorealistic characters and our next gen rendering and animation systems

MAXIMUM LENGTH OF DEMO REELS

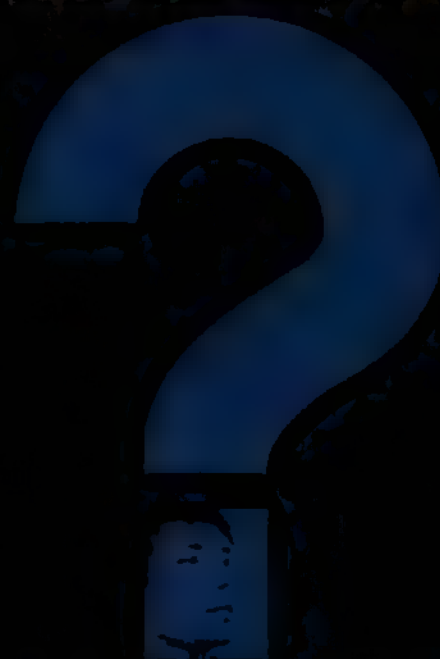
Three to five minutes

PREFERRED FORMAT FOR DEMO REEL SUBMISSIONS

QuickTime, DVD, or calling card with link to online portfolio

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BUSINESS END

Each issue, our panel of experts answers the legal and financial questions of freelancers and small studios. This month, we ask...

"Can they steal my idea?"

Q I created a pitch for a job with an illustrator friend of mine. I've since heard that someone else has now been awarded the work. I would like to get my pitch back because I can see that it has potential elsewhere, and I'm worried about my ideas being used without consent. Where do I stand legally? **MAURIKEN BILLMAN, VIA EMAIL**

A Two of the most common questions asked by creative businesses are what, if anything, can they do to protect their pitches, and - particularly when a pitch has an interactive element - how can they maintain the integrity of files sent either speculatively or in response to a direct invitation?

It's a common myth that pitches are unprotected or that they belong to no one. But, just like any other type of creative work, the copyright and related rights (such as unregistered design rights) will belong to the creators of the pitch - unless it was created in the course of their employment. In which case, it will belong to the employer. The other thing to bear in mind when it comes to making a pitch is that they're often owned by more than one person, because they're often collaborative. Think about who owns what and what rights you need if you get the work for which you're pitching. For example, if your illustrator is about to go on a round-the-world holiday, it would be wise to consider obtaining written permission to use his or her work, in the event that you're awarded the work on which the pitch is based. Such permission would either be an assignment of the rights in work (typically copyright and design rights), or a licence depending on whether you seek to own the illustrator's work outright or merely the right to use it.

Also think about what it is that you are pitching. In the UK, there is no intellectual property rights (IPR) protection for ideas in themselves. Such IPRs only bite when an original idea is expressed in a permanent form. Therefore, if you intend your pitch to be more of a free-form brainstorm rather than a formal pitch document, you will need to think about protecting yourself with an NDA.

In fact, you should get into the habit of submitting all pitches under a non-disclosure agreement. A non-disclosure agreement (NDA) is a written agreement that places an obligation on the party receiving your pitch to neither use nor disclose the contents of the pitch, except where it's necessary for evaluation purposes.

As well as an NDA, you should also use a Confidentiality Notice. This is a statement that you should make sure you attach to all documents that you submit, making clear that their contents are to be considered confidential and that they may not be reproduced except with the express permission of the owner. This will make it even more difficult for a party to say that they were unaware of

the confidential nature of your pitch, or that they understood the document to have originated within their own organisation.

For an NDA to be binding (and therefore enforceable by you against the company for whose business you're pitching), it ought to be signed by both you and the company before the pitch is disclosed to it. Once the information is in the public domain, it won't be capable of being subject to the NDA. Therefore, it's absolutely crucial that you get the agreement signed ahead of sending any documents for review in the pitch process.

On all documents, whether hardcopy or electronic, you should use the following wording to assert your ownership of the work: "Copyright (c) [name(s) of author(s)] 200[]". This has the effect of asserting copyright in the pitch. Note that adding the wording doesn't actually give you any additional rights - copyright exists automatically as the work is created. However, it is good practice to get into the habit of asserting your rights in this way whenever you're showing, submitting or sharing your work in any form.

BACK-UPS

When pitching, you should also make sure that you keep back-up copies of everything that you submit as part of the pitch process. You mentioned that you want the pitch sent back to you, in order to submit it elsewhere. This indicates that you haven't kept a record of what you have sent in, which could make it difficult to mount a claim successfully if you suspect that the recipient of the pitch has infringed your intellectual property rights. Copyright is a negative right in the sense that you have to show that a third party has actively copied your work - it's not enough merely to show that such a third party has created a work that is the same as yours. You also need to show that the pitch is original to you as the author of the work. Therefore, you should keep the 'story' of every pitch you create so that you can show its development, and thus that it is your own original work.

Finally, keep monitoring your pitches and make sure that you know when the evaluation process is up, and therefore when the document or files you sent should be returned to you or destroyed. If you're particularly concerned about the actions of a company to which you submit a pitch, ask your client contact to confirm in writing that they have destroyed any electronic files and that they will not exploit your original work.

Lee Gage is an intellectual property solicitor at leading media and entertainment firm Harbottle & Lewis LLP. He advises creative businesses on all areas of IP and IT law issues. [w] www.harbottle.com

OTHER RESOURCES

www.themessare.com
An online log for pitches (launched in May 2005)

www.ideas21.co.uk
An inventors group, who offer advice in this area

Design Law: Protecting and Exploiting Rights by Margaret Briffa and Lee Gage. Lee Gage's own book on the subject (ISBN 1853288179) Price £59.95 www.lawsociety.org.uk

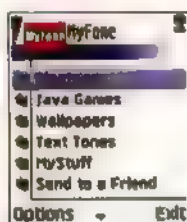
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A still from Rod Lord's graphics sequences for the original *Hitchhiker's Guide to the Galaxy* TV series. Although it may resemble a real infographic, on closer inspection, it shows that this planet is covered in meringue.

While the animation style anticipates later 3D imagery, the graphics were all created using traditional media: ink, paint, film and Letraset.

“Above left: Animation is the same whether you're using a pencil or 3ds max,” says Shynola's Jason Groves. “It's the ideas that matter. Is painting better now we can make images in Photoshop?”

INSPIRATIONS

This issue, animation collective **Shynola** discuss Rod Lord's graphics for the original UK TV version of *The Hitchhiker's Guide to the Galaxy*



CHRIS HARDING (left): “I saw *The Hitchhiker's Guide to the Galaxy* on the telly when it was first broadcast in 1981. I was six, and that's the first I'd heard of it. As best I can remember, I loved the graphics

straight away. I loved anything that was animated. The difference with Rod Lord's stuff is that it still looks good to me today, which is more than can be said for *Daytime* and the *Three Musketeers*. One particular sequence that captured my imagination was the piece about a fleet of alien ships attacking earth and being eaten by a small dog [owing to a “minor miscalculation of scale” - Ed]. I thought that was hilarious.

“The original Guide graphics were definitely an influence on me when we started work on the *Hitchhiker's* movie. Most of the other guys have been fans since they were kids, too. While we've never started a specific piece of work by saying, “Let's do something like Rod Lord”, it must have entered our subconscious. After all, he didn't invent wireframe graphics, he just used the style very effectively a long time ago.”

JASON GROVES (on the right in the image above): “I think it's the elegance of the images that appeals to me most. They look lovely and they tell the story perfectly. That's much harder to do than you would imagine. Am I interested in them as infographics? No, not really. Autistic people like pictures with numbers and arrows in them, other people don't care how information gets to

them, as long as it works. I think it's fair to say that there are a lot of high-functioning autistic men out there who drool over graphics. What does appeal to me is the sense of humour that was threaded throughout the work.

“Although we did want to steer clear of simply updating the animation, there are certain aspects of Rod Lord's work that we wanted to keep. One of these was the original Guide's strangeness. Since the TV series was recorded, an entire language of interactive computing has been invented. Because Rod Lord's Guide came before these rules were drawn up, it doesn't follow them, and that's why it still works today as something alien. If we'd just recreated the Guide using current graphics and accepted rules of interactivity - basically turning it into a website - our work would quickly have become dated.

“We are anticipating a fair amount of flak for our version of the Guide, not because we think that we didn't do it justice - our egos are healthy enough to allow that we did a good job - but because we know that nothing we could have done would have been to everyone's taste. Some people thought the TV series wasn't as good as the original radio plays. Have we asked what Rod Lord himself thinks of it? No. I'm sure he doesn't want to meet a load of spotty computer nerds.”

Shynola is an award-winning UK-based animation collective. The team's most recent job was creating the Guide graphics for the new *Hitchhiker's* movie. [w] www.shynola.com



ABOUT ROD LORD

Born in Salisbury in the former Rhodesia, self-described graphimator Rod Lord was educated at St. Martin's School of Art, London, before working at animation company Pearce Studios, eventually becoming Managing Director. One of the earliest users of 3D software in the UK. In addition to his BAFTA award-winning work on *The Hitchhiker's Guide to the Galaxy*, he also created the animation for *Max Headroom - The Movie*. His commercial work is now entirely digital. [w] www.rodlord.com

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modo offers the advantage of...

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- e) All the above

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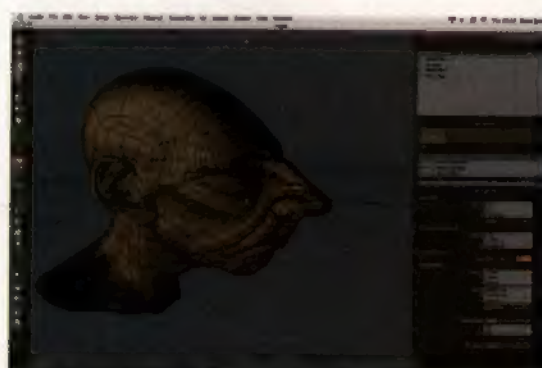
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FACTFILE

FORMAT

PC / Mac

MINIMUM SYSTEM

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- Pentium III / Athlon / G4 processor
- 256MB RAM

DEVELOPER

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WEBSITE

www.alias.com

USING THE CD

GETTING STARTED

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USING THE INTERFACE

The disc interface requires Windows 98, Me, 2000, XP or Mac OS 8+. You'll also need an active internet connection to make full use of the interface. For best results, ensure you're using a version 3 web browser or better.

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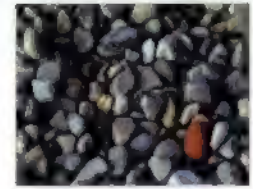
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www.kurvstudios.com

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**OTHER RESOURCES****20 TEXTURES**

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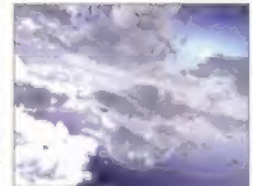
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SUPPORTING FILES

Full-sized screenshots, project files and other resources to accompany the tutorials and Q&As printed in the magazine this issue
Magazine contents: page 4

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